# A STUDY OF I.C.T.: STATUS AND USAGE IN HIGHER SECONDARY SCHOOLS OF JAMMU & KASHMIR

## THESIS

SUBMITTED FOR THE AWARD OF THE DEGREE OF

## Doctor of Philosophy

IN

## EDUCATION

By

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UNDER THE SUPERVISION OF

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2013

*Dedicated to*

*My Grandmother*

*Late Mrs. Taja-Ambir-U-Din-Dada*

*and My Parents*

*(Mr. & Mrs. Bashir Ahmad Munjkhal)*

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**(FARHAT BASHIR)**

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Farhat

***FARHAT BASHIR***

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# ABBREVIATIONS

| | |
|---|---|
| ET | Educational Technology |
| ICT | Information and Communication Technology |
| IT | Information Technology |
| CT | Communication Technology |
| ICTs | Information and Communication Technologies |
| JKSBOSE | Jammu and Kashmir State Board of School Education |
| DIET | District Institute of Education and Training |
| SIET | State Institution of Education and Training |
| FIR | First Information Report |
| J & K | Jammu and Kashmir |
| HSS | Higher Secondary School |
| GHSS | Government Higher Secondary School |
| GBHSS | Government Boys Higher Secondary School |
| GGHSS | Government Girls Higher Secondary School |
| G (Co-Ed.) HSS | Government Co-Educational Higher Secondary School |
| PHSS | Private Higher Secondary School |
| PBHSS | Private Boys Higher Secondary School |
| PGHSS | Private Girls Higher Secondary School |
| P (Co-Ed.) HSS | Private Co-Educational Higher Secondary School |

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# INTRODUCTION

## CHAPTER I

# INTRODUCTION

Education is a powerful instrument that unlocks the door to prosperity of a nation. It is one of the main keys to the development and the improvement of mankind. Since education is regarded as the bedrock for nation building, its quality management is necessary. It is the most prominent factor that affects the overall development and prosperity of any nation. It is the acquisition of knowledge or information that empowers a person towards a better and higher way of life. According to the Report of the Education Commission of 1964-66 "The destiny of India is now being shaped in her classrooms". In the world of Science and Technology, it is education which determines the level of prosperity, welfare, comfort and security. Thus education is a means of prosperity and welfare of the nation. Its field is so wide that all activities and experiences are embraced in its sphere of work. Education is the single most important instrument for social and economic renovation. A well educated population, adequately equipped with knowledge and skills, is not only essential to support moneymaking growth but is also a precondition for growth to be comprehensive since it is the educated and skilled person who can stand to benefit most from the employment opportunities which growth will provide (Planning Commission, 2011). The process of education involves the transfer of communication of knowledge and skills from one point (source) to another (receiver). The source is the teacher and the receiver is the student. During the recent past, the teaching and learning process was dependent upon the Chalk and Talk method but now it has undergone a radical change and Smart Classrooms (fully well equipped electronic web) have been developed.

The role of education in facilitating social and economic progress is well recognized. It opens up new chances leading to the individual and group entitlements. Education, in its widest sense, is the development of youth which is the most crucial input for empowering people with skills and knowledge and giving them access to dynamic services in future. Improvements in education are not only expected to enhance efficiency but also augment the overall quality of life. The Eleventh Five Year Plan 2007-2012 places the highest priority on education as a central instrument

for achieving rapid and inclusive growth (Planning Commission, 2008). Education plays a major role in keeping young aspirants of the society aware and up-to-date with the new developments. Introducing ICTs in the educational setting is a major endeavor. Education through Information and Communication Technology (ICT) has become effective, useful and interesting way of proceeding teaching practice now-a-days. Across the globe, countries have recognized ICT as an effective tool in catalyzing the teaching learning process. Information Technologies together with Communication Technologies have brought about unprecedented changes in the way people communicate and interact with the society. Our challenging and competitive world demands technology based education which is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and modern technologies are demanding teachers and students to learn how to use these technologies in their teaching and learning process. While new technologies augment, the need of innovative teacher training arises. ICT can not only provide more flexible and effective ways for professional development of teachers and students but it also improves pre- and in-service teacher training and connects teachers to the worldwide teacher community.

## 1.1 Educational Technology

From the history of media, one could know that new forms never replaced the old ones. TV didn't kill radio and the internet didn't kill TV. New forms of media rather harmonize the old ones, but do not countervail them, albeit this leads to greater choices for people and also cause fragmentation. Different media policies and formats also get mixed with each other and this way generates new forms that contain features of each of them. The iPod is a good example of this. It is a walkman of the Internet era that can be used to personalize radio shows (podcasting). Same is the case with sub-cultures, as well. New forms of sub-culture, such as youth culture are often considered to be some kind of fashion that come and go, but actually all the old forms seem to stay in the present system such as punk rockers, pot and acid heads, although one may consider them to rather passe. They also mix with each other and formulate new forms of sub-cultures. This is the case with educational technology, as well. All the old customs and traditions live with new ones and get mixed in with each other.

The old models just never disappeared but are present in one form or another in the new paradigms.

In describing the state of Educational Technology (ET), the most accurate statement that one can make about our present (instructional) methods is that they are ancient technology. The basic mode of instruction, such as blackboards, textbooks, chalks, and teachers, has been used for many years. Today teachers are better prepared, textbooks are better written and better designed, and chalkboards have changed color, but their functions and their relationship to learners have not changed essentially in over one hundred years. Furthermore the process, by means of which teaching is carried on, has not changed in any fundamental respect during this period. The process of education remains teacher-centered, group-oriented and textbook-based (Engler, 1972). This practice has undergone many modifications over the past century and a half; the general configuration of mass production education remains essential and original to this technology.

Educational Technology (ET) implies a behavioral science approach to teaching and learning. It makes use of pertinent scientific and technological methods and concepts developed in psychology, sociology, linguistics and other related fields. Educational Technology as a concept does not necessarily imply the use of machines and other items of hardware. It refers to the systematic application of techniques and principles to achieve an objective which results in new design and devices to improve human productivity. Education is the process of acquiring and imparting the knowledge, crucial to the development of a learner. Therefore, it can be concluded that the educational technology is the application of the principles of education to improve human learning. The ET is the means for effective learning. But the effective learning could only come through the effective application of Educational Technology, which in turn is dependent upon its proper use and integration. The growing use of ET in today's school has helped to release the teacher from the routine role of 'information giving', so that he can devote his time and effort to the more important test of planning, arranging and evaluating learning experiences and outcomes and to encourage, enthuse, guide and counsel pupils. The various technological media are used to communicate the needed factual information to the

pupils and they are capable of doing this perhaps more accurately and efficiently than the teachers. So today's 'pupils acquire knowledge through the various media and behavioral changes via the teacher'.

## 1.2 Information and Communication Technology

Information Technology (IT) has become a buzzword while talking about technology and its applications. The hardware, software and the methods used or required in attaining, storing, processing and displaying data and information is collectively known as IT. On the other hand, many developments and achievements took place in Communication Technology (CT) sector after the Second World War. Hardware programs and the methods used in ensuring that the message is transmitted appropriately, efficiently and cost effectively are jointly known as CT. Both of these technologies became complementary to each other. The means of progress in one alone is not much beneficial. Hence a combination of IT and CT led to the coinage of a new term known as Information and Communication Technology (ICT). It has been also described by (Tusubira & Kyeyune, 2001) as the convergence of these two technologies IT and CT gave origin to ICT. One of the most remarkable changes in the late 80's and 90's has been the rapid development of ICT which has gradually found its way into the classrooms through both the conventional and the modern tools. Consequently, the effective use of ICT in schools has become an essential requirement due to its role as a tool for human advancement and learning. These technologies have caught attention of many educators and researchers. According to Blease (1986), micro technology is something that is used for "achieving one's objectives more quickly, more cheaply or more successfully". As a technical tool, ICT has the power to transform the teaching and learning process in the field of education. Liaw (2002) emphasized that "with the enormous advances in communication and computer technology, the educational system urgently needs the application of this technology in order to enhance the quality of teaching and learning".

As per the Twelfth Five Year Plan 2012-17, the innovative programs and policies were required at the Centre and in the States for ICT to permeate rapidly in India, so that it can enable India to achieve its goal of more inclusive and faster growth. The country must provide affordable, reasonable and accessible education,

health care, skill development and financial services, very rapidly and on a very large level. Moreover, the citizens are demanding improvement of governance with greater efficiency in the delivery of public service and greater clearness. Information and Communication Technologies (ICT) can allow the promotions and innovations "necessary for providing affordable and accessible social sector services" (Planning Commission 2011).

In the words of Siraj-Blatchford & Siraj-Blatchford (2003), ICT can be defined as anything which permits us to get information and helps us to communicate with each other, or it can have an effect on the surroundings using electronic or digital apparatus. ICT includes computers (including desktops, laptops, and handle held computers); digital cameras and digital video cameras; creativity and communication software and tools; the internet; telephones, fax machines, mobile telephones, tape recorders; interactive stories, simulated environments, and computer games; programmable toys and "control" technologies; videoconferencing technologies and closed-circuit television; data projectors, electronic whiteboards and more (Shah and Godiyal, 2009).

Information and Communication Technologies (ICTs) are defined, as a varied set of technological equipments and resources used to communicate and to generate, disseminate, store and handle information. Advances in technology and the way technology is incorporated into a system is a dynamic process. Each school must work within the context of its own system according to their own choices, or which suits them best in its unique situation and culture. Even within a school, various units or courses may use different approaches. The approaches are in order, starting with the emerging approach as a beginning point followed by the applying, infusing and the transforming approach. In this respect, Ali (2012) remarked, there is general consensus that the integration of ICT in education precedes progressively in a series of the most important steps namely; emerging approaches, applying approach, infusing approach and transforming approaches.

1. **Emerging Approach**: In the emerging phase, schools are just beginning to introduce ICT; initially there may be very few ICT tools. As their journey starts along with the ICT, administrators and a few highly motivated

teachers begin to explore the potential of ICT for school management and for classroom teaching. Thus, ICT in this phase helps them to know how to apply and use ICT in the teaching and learning process and becoming aware of the potentials of ICT in their future teaching.

2. **Applying Approach:** Schools, at the applying phase acquire additional ICT equipments, which are used for more organizational and management tasks by school administrators. Teachers begin to apply specific software ICT tools such as drawing, designing, modeling, etc. in their teaching at this stage. The opportunity to apply ICT in their teaching is often limited only by a lack of ready access to ICT facilities.

3. **Infusing Approach:** Schools, at the infusing phase incorporate ICT across the curriculum. It involves teachers in the integration of different knowledge and skills from other subjects into project-based curricula. The curriculum begins to merge subject areas to reflect real-world applications. Teachers use ICT to assist their students to access their own learning in achieving their aims.

4. **Transforming Approach**: In the transforming phase, ICT is fully integrated into all regular classroom learning activities, and is used to rethink and renew institutional organizations in a creative way. The focus in the classrooms has moved fully from teacher-centered to learner-centered that integrates subject areas in real-world applications. To conclude, at the transforming phase, teachers regard ICT as a natural part of the everyday life of their institutions and centre of learning for their communities.

Undoubtedly, ICT has been the greatest change agent of this century and promises to play this role even more in the coming decades. Although it holds a great potential to support educational development efforts, several issues are in the way of effective integration of ICT in the educational practices in schools. Educational policy and planning, infrastructure required to ICT-based education, capacity building in ICT integration among teachers, technical support specialists and content developers in the country, technically standardized content in Indian languages, protection of intellectual property rights, teachers' attitude towards

ICT, digital divide, etc. are examples of the major issues in the way of ICT integration in school education. The report of the CABE Committee on ICT and the draft National Policy on ICT were collectively adopted. Suggestions were made on making a digital version of text books on Akaash Tablet available for use by the teachers and the students in schools, the focal point was the capacity building of teacher educators and need for all the states of the country to review their current ICT policies and strategies in light of the provisions of the National Policy (Govt. of India 2012). ICT has become the chief determinant of the progress of any nation. With ICT developments it has become essential for a developing nation like India to keep pace with modern development.

### 1.2.1 ICT Tools

There are various ICT tools available which can be utilized for the knowledge creation and dissemination in the recent world. Tools include Radio, T.V, Internet, Mobile phone, Computer, Films, Projectors, Microscopes, Potentiometers, Liquid crystal displays, Microphones and many other hardware and software applications. These ICT tools have their own implication in Education. These devices can be used for imparting education in schools and training for teachers and students. Many of the ICT tools are much hyped but have not given fruitful results till now because of the low status and little usage in the schools. For instance, the use of radio for pedagogical practices has been very much popular in the past and is still in use, in India. But one-to-many broadcast technologies like radio and television are seen as less revolutionary in most of the states in India. ICTs in education, as their usage is seen as reinforcing of traditional instructor-centric learning mock-up, unlike computers, which many see as imperative tools in fostering more learner-centric instructional models (ICT in School Education, 2010).

Educational ICT tools are not for making educators, master ICT skills themselves, but for making educators to create a more effective learning environment by means of ICT. Teachers can make use of ICTs to get benefits from using these equipments in the area of the content, curriculum, teaching, training and assessment. ICT's include fixed-line telephony (land line phones), mobile telephony, newspapers, radio, television, online teaching and learning, computer, microscopes etc. which

must be accessible to all school students and teachers as per their demand. School children and the teachers using various ICT tools must be fully trained about these ICT tools so that they can handle them easily. It is clear that the application of various ICT tools that are the most important determinants in the field of education, are quite varied and each has its own advantages and disadvantages. Policymakers, Administrators, and Boards which are handling the education systems in India are often bombarded by information and studies from vendors on the suitability of ICT products to meet the educational needs.

### 1.2.2 Usage of ICT in Schools

Teaching in the classrooms through ICT tools probably began with conventional blackboard and chalk. Gradually with the realization of the benefits of using technology, more advanced ones started making inroads into classrooms. As noted in the World Education Report: (UNESCO, 1998a), education worldwide is facing a significant challenge in preparing students and teachers for "our future 'knowledge-based' society" during a time when most teachers are not prepared to use ICT and the bulk of existing school buildings, even in the majority of the developed countries, are not equipped to integrate the new Information and Communication Technologies.

ICT applications are becoming indispensable parts of contemporary culture, spreading across the globe through traditional and vocational education. In India, the education system has three tiers- Primary (including nursery and pre-primary), High School or Secondary level (high and higher secondary levels) and the College or Higher level (including college, university levels). In all these levels of education ICT can be utilized for better teaching learning process and improving quality of education system as a whole. Incorporating of the ICT into education system can increase the quality of education (UNESCO, 2007). The use of ICT in education results in the increasing productivity and retention rates, because people remember 20% of what they see, 40% of what they hear, but about 75% of what they see and hear and do simultaneously. As everybody knows that mind is a place where all kinds of information are processed and on its basis all kinds of thoughts and ideas are generated. The five senses supply a great variety of sensations, among all the senses,

ears and eyes are perhaps the most important connections which the body and the mind have with the external world (Audio + visual leave a longer impact rather than audio and/or other).

The use of the Information and Communication Technologies (ICTs) to deliver educational resources is considered mainstream in the present 21st century, yet in secondary education it is often seen as a luxury. The use of ICT has far reaching consequences for teachers, learners and educational institutions of secondary level. which often comprise a lack of basic ICT infrastructure and inadequate or no support for the training of teachers and learners in the use of online digital information resources. It is progressively more accepted that in the future most information sources and desktop applications currently in use will be mainly accessed through the internet, now increasingly referred to as 'the cloud'. This means that at secondary school level ICTs should be adopted as a matter of urgency to enable teachers and learners to access this new direction in internet technology and application delivery (Le Roux & Evans, 2011).

Advances in electronic-based ICTs are rapidly transforming social and economic conditions across the sphere. As the cost of ICTs continues to reduce and their capabilities increase, their functions are becoming even more vital to all sectors of the economy and society. Mansell & Wehn (1998), pointed out that the increasing spread and uses of ICT create new opportunities for low-income countries to harness these technologies and services to promote social and economic development and human integrity. ICT has the power to improve the quality of life by providing new tools for improving access to information and knowledge management as well as sharing. These days the term Information and Communication Technology (ICT) has come to mean all technical means used to handle information and aid communication, including the computers and network of the hardware as well as the necessary software (Rubab 2011).

The interactive Information and Communication Technologies (ICT; computers, the internet, mobile phones, digital games) change the everyday life of adolescents worldwide. In Finland, all young people have access to a mobile phone, and most of them to a computer and the internet (Nordic Council of Ministers.

Statistics Denmark, Statistics Finland, 2002). Consequently, ICT, as a necessary resource in the modern information society, might become a factor contributing to educational inequality and divide between young people. ICTs hold great promise in the drive for development and poverty reduction in the global South. The possibilities of unregulated access to and sharing of information for networking to different communities, education and individual empowerment can hardly be overestimated by the social, economic and political development. According to the National Policy on ICT in School Education (2011), "ICT could be very gainfully employed for digitizing and disseminating existing resources" like printed books, charts showing figures, documents and posters, which have been widely used in the school system, in order to enhance its reach and use. A successful utilization of the knowledge superhighway is the predictor of two assumptions: first, realistic opportunity to use ICTs that everybody has broadly defined; and second, that ICTs are planned and placed in ways that are supportive of gender and cultural differences.

One of the most exciting changes in teaching has been brought about by advances in ICT and by the availability of these technologies in the schools. This is possible because of the ICT tool availability. ICT can be constructively leveraged to propagate information about and catalyze adaptation, adoption, conversion and distribution of sparse educational assets distributed across various media and forms. This will help to encourage its widespread accessibility and extensive use (National Policy on ICT in Education, 2011).

Implementation of technology based training program in schools requires a lot of planning. It is very important for a teacher to understand how ICT technologies can be useful in different areas. Only then these technologies can be implemented in the teaching and learning process. National Policy on ICT in School Education (2009) reported that, at the school level the local area network can enable automation of a variety of processes. Commencing with library mechanization, locally cached offline access to internet resources, office automation, maintenance of all the school records, student tracking, resource planning, using the existing ICT infrastructure will increase efficiencies. In short, it can be said that the technologies in all forms, new or outdated and simple or complex, can be effective tools that make individuals to rethink their

old beliefs, knowledge and understandings. ICT today is almost indispensable for self-learning. It allows learning/teaching at anytime, anywhere and also collaborative.

### 1.3 Educational System in Jammu and Kashmir

In Jammu and Kashmir there are four stages of school education, namely, Lower Primary (class 1-5) Upper Primary (class 6-8) Secondary (class 9-10) and Higher Secondary (class 11-12). Lower Primary and Upper Primary together are known as elementary level schooling; Secondary Schools with (9-10) are known as High schools and the secondary schools with (11-12) are named as Higher Secondary schools. Overall, schooling lasts 12 years, following the "10+2 pattern". School Education in India is organized in four stages- the Primary, the Upper Primary, the Secondary and the Higher Secondary. The division of ten-year general school education into the primary, the upper primary and the Secondary continues to be different in some of the states and Union Territories (Status of Education in India National Report, 2008). However, there are considerable differences between the various states in terms of the organizational patterns within these first 10 years of schooling. Upper Primary and Secondary school pupils aged eleven to fifteen are organized into classes from six to ten, and Higher Secondary school students aged sixteen to seventeen are enrolled in classes eleven and twelve.

As per the Jammu and Kashmir State Board of School Education "The students are usually allowed to seek the admission in first primary class at (+6) age". However the students are allowed to appear $10^{th}$ class (Matriculation) examination at the attainment of age of plus 14.The education system in the schools follows 10+2 pattern, from Primary to High school ($10^{th}$) and then followed by the two years of Higher Secondary school (11th and $12^{th}$ class). In the state of Jammu and Kashmir the 10+2 pattern is being followed for education of children (Wikipedia). The Jammu and Kashmir State Board of School Education handles the system of education up to Higher Secondary level (JKSBOSE, 2008). The examinations of the students of all government schools including recognized private schools for class $10^{th}$ and $12^{th}$ are conducted by the JKSBOSE. All the school examinations from pre-primary to 9th and $11^{th}$ are conducted under the Continuous and Comprehensive Evaluation (CCE) scheme evolved by the JKSBOSE under the purview of National Policy on Education

(NPE) 1986 and The Program of Action (POA) 1992. In all the states and UTs public examinations are conducted at the end of grade 10 and of grade 12 by the respective State Boards of Secondary and Higher Secondary Education. In 2009, uninterrupted and comprehensive evaluation has been introduced in grades 9 and 10 (World Data on Education, 2011).

The school management is broadly categorized into two sectors namely, government and private. Private schools are non-government institutions; they do not have any kind of support from the Government while as government schools are completely supported by the Central or State Government. In Jammu and Kashmir government schools are governed by the State Government of Jammu and Kashmir and the private schools are run by the individuals or by their own elected members of management.

The schools under consideration of the present study are Higher Secondary Schools (HSS). These include those schools which run the classes either from 'Pre-primary to Higher Secondary' or 'High to Higher Secondary'. The schools in which only male students attend the institution are known as Boys Higher Secondary Schools (BHSS). The schools in which only female students attend the institution are known as Girls Higher Secondary Schools (GHSS). The schools which impart education to both female and male students in the same class are known as Co-Educational Higher Secondary Schools (Co-Ed. HSS).

### 1.3.1 Pay Scale of Teachers in Jammu and Kashmir

After ascertaining the rules for the last three decades (from 1982), with regard to the pay structures passed in favor of the Government employees of the state of Jammu and Kashmir, it is revealed that various grade revisions have been applied to the teaching staff of the state school Education till date. "The Government of Jammu and Kashmir Finance Department Notified Revised Pay Rules, (Vide SRO-93, 2009) applicable to persons appointed to civil services and posts in connection with the affairs of the state including those paid from contingencies or charged to works whose pay is debatable to the Consolidated Fund of the State including those on deputation to other Governments/Organizations" (Government of Jammu & Kashmir, 2009).

This rule reflects that where a Government servant is holding a permanei post and is officiating in a higher post on a regular basis, the scales applicable t these posts are merged into one scale. Besides this the posts have been upgraded an only Four Pay Band Scales for superior officials have been structured. The Jamm and Kashmir State has revised the Pay Scales during April 2009 effective from 0 01-2006 under (SRO-93.2009). The following Scales and Pay Bands shown in th First schedule of (Government of Jammu and Kashmir SRO-93.2009) applicable the School Education Department of the state have been extracted and tabled in tab 1.1.

In terms of the various rules shown under reference below and the Scales and Pay Bands shown above in the first schedule of the Jammu and Kashmir State Finance Department Notified Revised Pay Rules, Vide SRO-93 Dated 15th April, 2009, it is observed as per table 1.1 that:-

a). the teachers recruited with 10+2 qualification are installed in the Pay Scale/Band showing above at S. No. 1 and the grade shown above at S. No. 2 are applied to the teachers recruited with graduation or trained graduation (Graduate + B. Ed) qualifications.

b). either to head the Middle Schools (schools up to 8$^{th}$class) or to work in High and Higher Secondary Schools. The B. Ed qualified teachers on the strict seniority basis, are promoted as masters against the Pay Scale shown at S. No. 8 of table 1.1.

c). likewise, the masters working in High, Higher Secondary Schools or heading the Middle Schools are promoted on the strict seniority basis as High School Headmasters (Gazetted Cadre) and are placed in the Pay Scale shown at S. No. 10 of the table 1.1.

d). the Postgraduate masters and teachers on the strict seniority basis are also promoted as 10+2 lecturers against the scales shown in table 1.1 at S. No. 10.

## Table 1.1

### SCALES (AS PER REVISED PAY RULES, 2009) Vide SRO-93

**(Dated 15th-April, 2009)**

| S.No. | Existing pay scale | Name of the pay Band | Corresponding pay Band/scales | Corresponding Grade Pay |
|---|---|---|---|---|
| 1 | 4000-6000 | PB-1 | 5200-20200 | 2400 |
| 2 | 4500-7000 | PB-1 | 5200-20200 | 2800 |
| 3 | 5000-8000 | PB-2 | 9300-34800 | 4200 |
| 4 | 5150-8300 | PB-2 | 9300-34800 | 4200 |
| 5 | 5500-9000 | PB-2 | 9300-34800 | 4200 |
| 6 | 5600-9100 | PB-2 | 9300-34800 | 4200 |
| 7 | 5700-10100 | PB-2 | 9300-34800 | 4200 |
| 8 | 6500-10500 | PB-2 | 9300-34800 | 4200 |
| 9 | 6700-10700 | PB-2 | 9300-34800 | 4300 |
| 10 | 6700-10900 | PB-2 | 9300-34800 | 4400 |
| 11 | 7450-11500 | PB-2 | 9300-34800 | 4600 |
| 12 | 7500-12000 | PB-2 | 9300-34800 | 4800 |
| 13 | 8000-12950 | PB-2 | 9300-34800 | 5200 |
| 14 | 8000-13500 | PB-2 | 9300-34800 | 5400 |
| 15 | 9000-14100 | PB-3 | 15600-39100 | 5600 |

The lecturer posts of various disciplines are filled up by the Public Service Commission and by the Departmental Promotion Committee (cleared by Public Service Commission), on 1:1 ratio i.e. 50% posts subject wise are directly recruited by the department on the recommendations of the Public Service Commission and 50% posts subject wise are filled up by way of promotion amongst postgraduate masters/teachers of the department on the strict seniority basis. The post graduate

candidates with B. Ed or without B. Ed either selected by the Public Service Commission directly or promoted amongst postgraduate masters and teachers are also eligible for the Pay Scale shown at S. No.10 of the table 1.1.

e). the Headmaster High Schools after serving normally for 05 years are promoted as Zonal Education Officers and are eligible for the Pay Scale, shown at S. No. 11. The 10 + 2 lecturers after serving normally for 05 years are promoted as Senior lecturers and are eligible for the Pay Scale shown at S. No. 12 of table1.1.

f). the principal posts of Higher Secondary Schools are filled up by way of promotion, 80% amongst senior lecturers and 20% amongst postgraduate Zonal Education Officers after serving at least for five years as Senior Lecturer/Zonal Education Officers and the grade applicable for the principal post is as shown at S. No. 15 in table 1.1.

It has been ascertained as well as observed from the various pay rules referred above, that the basic minimum qualification of the General Line Teachers of the Education Department of Jammu and Kashmir must be 10+2. The minimum qualification for the teacher post in Jammu and Kashmir State is 10 +2 and there is no separate graded system prescribed for Primary School Teacher, Middle School Teacher or High or Higher Secondary school teachers. The teachers working either at the elementary level, Secondary level, High and Higher Secondary level are known as General Line Teachers.

The private institutions have different pay scales ranging from 1000 to 8000. Private schools either run by management, individual or by any trust, have their own framed rules and appoint the teachers at their own, while as the teachers in JKSBOSE are usually recruited in graded Pay Scales by the government purely on the selection made by Jammu and Kashmir State, Service Selection Recruitment Board (SSRB). Besides this, in order to run the schools, the government also engages "Rehbar Taleem" on monthly consolidated honorarium @ Rs 1500/=, firstly for a spell of complete five years for Primary to High schools and are brought in the graded Pay Scales after the completion of 5 years.

### 1.3.2 Educational Development in Jammu and Kashmir:

Jammu and Kashmir is a very ethno-linguistically complex and culturally unique state, the origin of which can be traced back to its dense history (Burki, 2007). The current status of educational development in Jammu and Kashmir is important to explore because it demonstrates how the state manages an education system after a significant amount of violence. The education system as a whole suffered absolutely due to militancy. Quality education became a rare thing and high cost commodity. While education in the schools could not be carried out properly, examinations became a farce mainly because of copying. Everything could be done through gun and money. What was left in the shape of school buildings, were either burnt by the militants or taken over by security forces (Dabla, 2010). The school buildings became the targets from the very beginning of the current spate of militancy. The present situation of education in the state of Jammu and Kashmir was very much affected due to armed insurgency. Many schools, colleges, libraries etc. were put to ablaze, and examinations are being repeatedly postponed due to abnormal circumstances and the valuable time of the students is being wasted. The students, teachers and the other staff members of the school attend the schools with immense difficulties. Another fatality of the cult of violence in the state is the education system. It was under great wrench for the last three years. Number of schools, colleges and some reputed public libraries with a rich collection of books have been set ablaze and were reduced to ashes. The 1,700 Government schools in the Kashmir Valley did not have their own building and were being run in the hired accommodation, the school buildings which were damaged or gutted in terrorist activities were 244 in the Valley. These incorporated the primary schools, the middle schools, the high schools and the higher secondary schools in a number of (79), (81), (63) and (21) respectively (Maheshwari, 2013). The education system of Jammu and Kashmir is in turmoil. In this turmoil an attempt is being made to climb on the ladder of success through improper means.

The Board of School Education (BOSE) is the central authority regarding education in Jammu and Kashmir (JKSBOSE, 2008; Ganai, 2008). Currently, BOSE runs more than 10,609 schools across the State and employs 22,300 teachers (Government of Jammu & Kashmir, 2007). According to J & K State Board of School

Education JKSBOSE (2008), there are 14,938 public and private schools approximately in JK, including the primary schools, the elementary schools, the secondary schools and the senior secondary schools.

In 1986, Board of School Education (BOSE) established District Institute of Education Training (DIET) and Institutes of Advanced study in Education (IASE) to standardize and improve the quality of teacher education in J & K. JKSBOSE largely bases their policies and programmes on exams conducted for students in $8^{th}$, $10^{th}$, and $12^{th}$ grade. Reforms and changes are also beginning to occur for an improved, well rounded, and inclusive education system (Ganai, 2008). According to the J & K State Board of School Education (JKSBOSE, 2008), the introduction of the Kashmiri language into the secondary school curriculum is an effort to preserve the language and heritage of Kashmir; it is now given as an optional language course up to ($8^{th}$ grade).

### 1.4 Significance of the Study

After the attainment of independence, several policies and programmes in India were made to improve the usage and the status of ICT in secondary schools but still after 66 years of independence we fail to achieve the desired target due to several reasons such as poverty, lack of infrastructure, inaccessibility of schools in rural areas, lack of effective teacher training, gender discrimination, etc. The schools face a greater challenge today to keep pace with the continued progress in information resources. Changes are inevitable and therefore a school can provide effective education if it can adapt the changing scenario. ICT if used properly has the potential to radically alter the manner in which students learn and teachers teach. No amount of technological upgradation of educational institutions will change the performance of our students unless the teachers themselves know the proper usage and application of ICT in the teaching and learning process. The findings of this research were assumed to throw light on the Status and the Usage of ICT in schools. The results of the study could help schools to prepare and provide the direction for the Usage of ICT for both the teachers as well as the students.

A suitably oriented system of education can facilitate and promote social change and contribute to economic growth by creating requisite attitudes for the

specific task of development. Expansion at all levels of education has accordingly been a major problem with planners and administrations. Although, in the recent years, through ICT much has been done to provide better education to the students, but specific measures need to be put in place to ensure the use of ICTs particularly in the field of Secondary Education. ICT can be used to accelerate, enrich and deepen skills, helps to relate school experiences to work practices, helps to create the financial viability for tomorrow's workers, contributes to radical changes in school, make stronger teaching and provides opportunities for connections between the students and the world (Yusuf, 2005).

In addition to the significance discussed above, this study aims to highlight the present Status and the Usage of ICT. It is important to obtain more information about the use of ICTs within government institutions, both in the developed and developing countries (ICT Development Report, 2010). The present study has academic significance in providing the new information and updating the existing knowledge base of the subject. It gives a clear and strong information about the Status and Usage of ICT in the educational institutions as well as different factors affecting the usage of ICT by the students and teachers and it also provides some suggestions shown up to the policy makers especially to JKSBOSE (who is presently handling the schools of J & K) in the utilizations of technologies in the Higher Secondary Schools of Jammu and Kashmir.

### 1.5 Justification of Problem

Various studies revealed that the school teachers and students are not fully ready to imbibe ICT. The usage of ICT is very low due to the factors such as, least concern by the management, administration, policy makers, and the government. But so far as Jammu and Kashmir is concerned, the militancy brought a devastating and catastrophic effect in totality and the entire education system has been shattered. Dabla (2010), reported that the militancy in Jammu and Kashmir affected all the sections and sectors of the society leading to the social disorder and educational backwardness. Thousands of residential houses including schools and business establishments were burnt or destroyed.

The intermitted incidents of burning the schools evoke nothing but the feeling of sorrow on this state of affair. The problem remains unsolved. Many school buildings continue to burn starting from the nineties. According to the F.I.R. 1993, registered in the police station Bijbehara, the Government Higher Secondary School Bijbehara gutted in fire between the 29th and the 30th night of December 1993 and the other Government Higher Secondary Dailgam devastated by fire during the night of 11th and 12th of May 1995 and the F.I.R.1995, in this regard stands lodged in the police station Anantnag. Despite all the measures taken by the state and central Government, it has not been bunged.

The scheme of Information and Communication Technology (ICT) in schools is being implemented to bridge the digital divide in schools. Setting up the essential infrastructure to impart computer literacy and computer aided learning has been approved for 4752 government and government aided secondary and higher secondary schools (Report to the People, 2011-2012). From the various studies it has been drawn that the ICTs are not vigorously provided to the schools and if provided, they are not able to utilize them properly. That is why ICT is deficient in most of the schools. The government and other interested parties like management should consider the reshaping of ICT to fit better in the lives of adults (Selwyn. et.al., 2003). The main focus of some studies was concerned mainly with the curtailment of electricity which is very essential during the usage of ICT and the inadequacy (even outright absence) of essential service, infrastructure, internet and other modern ICT tools. According to Agymang. et.al., (2010) the main barrier identified that could affect the usefulness of the various ICTs was electricity, cost and accessibility. On the other hand, some studies reveal that students have a positive attitude towards the ICT usage and it not only helps them in their studies but also the students can change their study habits by its proper usage. It has been reported by (Babila, 2010) in the result of the study as: the students have a positive attitude towards ICT's usage and likely it helps them in their studies. Some of the studies reveal that very few teachers have time to develop study opportunities on the internet and other ICT tools. The ICT initiative should include measures for preparing the teachers to use ICT in their teaching practice. The teacher must be trained with ICT before being able to use it in their classrooms.

The use of ICT in the field of education has been a boon to the schools (teachers as well as students) as the latest information is available at their fingertips. The use of ICT in day to day activities in schools has a strong impact on every aspect of life as the schools produce the future generation. Through ICT the teachers and the students get direct information that is continuous, updated timely and reliable. The schools should have the sound ICT tools so that the students and teachers get benefit from it in their daily routine of teaching and learning process. The ICT modern and conventional tools have influenced the educational system, administration and organization to a great extent.

The usage of ICT in schools may improve the teaching learning process and can help the students as well as teachers to understand some complex matters in the classrooms, but it is only possible if the ICT items are available in the schools. It may be said that teaching and learning process in the schools can be improved by inculcating the usage of ICT. The successful ICT initiatives meet three intertwined objects: availability (status), accessibility (usage) and demands. To know the actual position of ICT in Jammu and Kashmir which has been affected by the insurgency more often in the span of 2-3 decades led the researcher to think and select a problem relating the status and the usage of ICT in the Schools.

### 1.6 Statement of Problem

"A Study of I.C.T. : Status and Usage in Higher Secondary Schools of Jammu and Kashmir".

### 1.7 Definition of Concepts

The process of defining the terms and concepts is essential because it allows for a specific content to be described and explained in the manner that pertains to the study. This will utilize specific terminology. In the study, the concepts need to be defined in a clear and non-confusing way. Here, this is understood as a "process of defining a concept by a set of other concepts" *(Bless & Higson-smith 1995).* Some specific concepts and terminologies have been repeatedly used in the study, which are described in this section.

### 1.7.1 Information and Communication Technology

Information and Communication Technology (ICT) is universally acknowledged as an important catalyst for social transformation and national progress. There is not any universally accepted definition of ICT because the application and the technology involved keep constantly changing almost on a daily basis. The transformation happens so fast which makes it difficult to keep up with them. ICT deals with the ways of storing, retrieval, transmission and receiving. ICT is an umbrella term that covers all technical means for processing and communicating information. The term has gained popularity partially due to the convergence of information technology (IT). ICT constitutes a broad range of technologies including methods of communication as well as techniques for storing and processing information.

*According to Blurton (2002)*

"ICTs stand for information and communication technologies and are defined, for the purposes of this primer, as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information."

*According to Rouse (2005)*

"ICT (Information and Communications Technology - or Technologies) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries".

*According to UNESCO*

"Information and communication technology (ICT) generally relate to those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technologies could include hardware (e.g.

computers and other devices); software applications; and connectivity (e.g. access to the internet, local networking infrastructure, video conferencing)".

*According to Wikipedia*

"Information and communications technology or information and communication technology (ICT), is often used as an extended synonym for information technology (IT), but is a more specific term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information".

*According to FOLDOC*

"ICT encompasses areas such as telephony, broadcast media and all types of audio and video processing and transmission".

Information and Communication Technologies deal with the use of technological tools in the educational process. It can be used to realize innovations in educational concepts and teaching and learning scenarios. Amongst other things, ICT can provide efficient organization of mass lectures through the storage and dissemination of teaching and learning materials.

The concept of ICT should not be confused with the electronic gadgetry only; it has a wider meaning as wide as education itself. It means that ICT is concerned with the delivering instructions, evaluation of learning experience and dissemination and transmission of knowledge. It helps in improving the task of teachers, facilitating the process of teaching and learning and enriches the aims and goals of education.

In the present study, ICT has been defined in terms of the technologies that facilitate the communication, the processing and the transmission of information. The process of teaching learning depends upon the usage of different kinds of equipments or tools by the teachers and students available in schools. The status and usage of ICT has been measured on the basis of self-prepared tools. ICT in education means implementing of the equipment in teaching and learning process as a media.

Sachdeva and Gupta have classified the ICT 'Educational Media' as traditional as well as technological media. "The Task Force appointed by the Department of Audio-Visual Institution of National Education Association of U.S.A. defined, Educational Media as those things which are manipulated seen, heard, or talked about, plus materials which facilitate such activity" (Sachdeva and Gupta 2003).

### 1.7.2 Higher Secondary Schools

*According to UNESCO*

"Secondary education is divided into secondary and higher secondary (academic or vocational) secondary education lasts for four years, divided into two two-year cycle (grades $9^{th}$- $10^{th}$and $11^{th}$ -$12^{th}$) higher secondary education comprises grades $11^{th}$ and $12^{th}$".

*According to Webster Dictionary*

"A school providing secondary education" and the secondary education is the "education beyond the elementary or primary and below the college level".

*According to Wikipedia*

"Secondary school is a term used to describe an educational institute where the final stage of compulsory schooling, known as secondary education, takes place it follows on from elementary or primary education"

*According to Merriam Webster Dictionary*

"A school intermediate between elementary school and college and usually offering general, technical, vocational, or college-preparatory courses"

Thus secondary school is the stage where the education, that follows the typically compulsory and comprehensive primary education, is given. It is a school that is intermediate in level between elementary school and college and that usually offers broad technology, vocational or college preparatory curricula. Therefore in the present study, a high school or a school of corresponding grade, ranking in between a primary school and a college is considered as a Higher Secondary School.

### 1.7.3 ICT Tools

The process of teaching and learning depends upon the different type of equipments / tools available in the classroom, whether conventional tools such as; black boards, charts, etc. or the recent tools like computer, projectors, etc. The classroom has to have different shapes in the times to come. It is just like a lab where all the hardware and software tools are lying. These materials/ tools help the teacher in good communication, healthy classroom interaction and effective realization of the teaching objectives.

According to 'Sachdeva and Gupta', (2003) ICT tools are those "instructional devices which are used in the classroom to encourage learning and thereby makes it easier and more interesting".

The purpose of ICT in education is to make the students and teachers familiar with its use and how it works. It is a known fact that the ICT has ushered a revolution within the classroom and the old paradigm of teacher centered education imparted mainly through 'chalk and talk' is giving way to learner centered one that promotes technology aided self learning. It is difficult to classify the ICT items available and used in the schools. In the classroom today teachers as well as students are using technology. While teachers may use technologies to support the instructions provided and for assessment, learners use it for learning. Thus in the present study the ICT items are classified as those solely meant for classroom teaching and those used only for self learning.

## 1.8 Objectives of the Study

The present study had a few objectives which are as under:

**1. To identify the Status of ICT in Higher Secondary Schools.**

1.1 To find out the Status of ICT in the Government Higher Secondary Schools (GHSS).

1.1.1 To identify the Status of ICT in the Government Boys Higher Secondary Schools (GBHSS).

1.1.2 To identify the Status of ICT in the Government Girls Higher Secondary Schools (GGHSS).

1.1.3 To identify the Status of ICT in the Government Co-Educational Higher Secondary Schools [G (Co-Ed.) HSS].

1.1.4 Comparison of Status of ICT among all the Government Higher Secondary Schools (GHSS).

1.2. To identify the Status of ICT in the Private Higher Secondary Schools (PHSS).

1.2.1 To identify the Status of ICT in the Private Boys Higher Secondary Schools (PBHSS).

1.2.2 To identify the Status of ICT in the Private Girls Higher Secondary Schools (PGHSS).

1.2.3 To identify the Status of ICT in the Private Co-Educational Higher Secondary Schools [P (Co-Ed.) HSS].

1.2.4 Comparison of Status of ICT among all the Private Higher Secondary Schools (PHSS).

1.3 Comparison between the Status of ICT in Government and Private Higher Secondary Schools (HSS).

1.3.1 Comparison between the Status of ICT in Government and Private Boys Higher Secondary Schools.

1.3.2 Comparison between the Status of ICT in Government and Private Girls Higher Secondary Schools.

1.3.2 Comparison between the Status of ICT in Government and Private Co-Educational Higher Secondary Schools.

**2. To find out the level of ICT Usage by the Students of Higher Secondary Schools.**

2.1. To find out the level of ICT Usage by the students of Government Higher Secondary Schools (GHSS).

2.1.1 To find out the level of ICT Usage by the students of Government Boys Higher Secondary Schools (GBHSS).

2.1.2 To find out the level of ICT Usage by the students of Government Girls Higher Secondary Schools (GGHSS).

2.1.3 To find out the level of ICT Usage by the students of the Government Co-Educational Higher Secondary Schools [G (Co-Ed.) HSS].

2.2. To find out the level of ICT Usage by the students of Private Higher Secondary Schools (PHSS).

2.2.1 To find out the level of ICT Usage by the students of Private Boys Higher Secondary Schools (PBHSS).

2.2.2 To find out the level of ICT Usage by the students of Private Girls Higher Secondary Schools (PGHSS).

2.2.3 To find out the level of ICT Usage by the students of Private Co-Educational Higher Secondary Schools [P (Co-Ed.) HSS].

2.3. To compare the level of ICT Usage between the students of Government and Private Boys Higher Secondary Schools.

2.3.1 To compare the level of ICT Usage between the students of Government and Private Boys Higher Secondary Schools.

2.3.2 To compare the level of ICT Usage between the students of Government and Private Girls Higher Secondary Schools.

2.3.3 To compare the level of ICT Usage by the students of Government and Private Co-Educational Higher Secondary Schools.

**3. To find out the level of ICT Usage by the Teachers of Higher Secondary Schools.**

3.1. To find out the level of ICT Usage by the teachers of Government Higher Secondary Schools (GHSS).

3.1.1 To find out the level of ICT Usage by the teachers of Government Boys Higher Secondary Schools (GBHSS).

3.1.2 To find out the level of ICT Usage by the teachers of Government Girls Higher Secondary Schools (GGHSS).

3.1.3 To find out the level of ICT Usage by the teachers of Government Co-Educational Higher Secondary Schools [G (Co-Ed.) HSS].

3.2. To find out the level of ICT Usage by the teachers of Private Higher Secondary Schools (PHSS).

3.2.1 To find out the level of ICT Usage by the teachers of Private Boys Higher Secondary Schools (PBHSS).

3.2.2 To find out the level of ICT Usage by the teachers of Private Girls Higher Secondary Schools (PGHSS).

3.2.3 To find out the level of ICT Usage by the teachers of Private Co-Educational Higher Secondary Schools [P (Co-Ed.) HSS].

3.3. To compare the level of ICT Usage between the teachers of Government and Private Boys Higher Secondary Schools.

3.3.1 To compare the level of ICT Usage between the teachers of Government and Private Boys Higher Secondary Schools.

3.3.2 To compare the level of ICT Usage between the teachers of Government and Private Girls Higher Secondary Schools.

3.3.3 To compare the level of ICT Usage by the teachers of Government and Private Co-Educational Higher Secondary Schools.

**1.9 Hypotheses of the Study**

The following hypotheses were recognized for the present study:

**Hypothesis 1**: There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Government Higher Secondary Schools.

1.1 There is a medium level of ICT usage by the students of Government Boys Higher Secondary Schools.

1.2 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Government Girls Higher Secondary Schools.

1.3 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of the Government Co- Educational Higher Secondary Schools.

**Hypothesis 2**: There is no significant difference between the real mean and assumed mean in the level of ICT usage in Private Higher Secondary Schools.

2.1 There is a medium level of ICT usage by the students in Private Boys Higher Secondary Schools.

2.2 There is a medium level of ICT usage by the students in Private Girls Higher Secondary Schools.

2.3 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Private Co-Educational Higher Secondary Schools.

**Hypothesis 3**: There is no significant difference between the Government and Private Higher Secondary School Students in the level of ICT usage.

3.1 There is no significant difference between Government and Private Boys Higher Secondary School students in the level of ICT usage.

3.2 There is no significant difference between Government and Private Girls Higher Secondary School students in the level of ICT usage.

3.3 There is no significant difference between Government and Private Co-Educational Higher Secondary School students in the level of ICT usage.

**Hypothesis 4**: There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Higher Secondary Schools.

4.1 There is a medium level of ICT usage by the teachers of Government Boys Higher Secondary Schools.

4.2 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Girls Higher Secondary Schools.

4.3 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Co-Educational Higher Secondary Schools.

**Hypothesis 5**: There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Private Higher Secondary Schools.

5.1 There is a medium level of ICT usage by the teachers of Private Boys Higher Secondary Schools.

5.2 There is a medium level of ICT usage by the teachers of Private Girls Higher Secondary Schools.

5.3 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Private Co-Educational Higher Secondary Schools.

**Hypothesis 6**: There is no significant difference between the Government and Private Higher Secondary School Teachers in the level of ICT usage.

6.1 There is no significant difference between Government and Private Boys Higher Secondary School teachers in the level of ICT usage.

6.2 There is no significant difference between Government and Private Girls Higher Secondary School teachers in the level of ICT usage.

6.3 There is no significant difference between Government and Private Co-Educational Higher Secondary School teachers in the level of ICT usage.

### 1.10 Basic Assumptions

It was assumed that the participants (teachers and students) were capable of describing the usage of ICT in their schools as required in the study. It was further assumed that the participants will be candid in their responses to the survey items. The researcher also presumed that the responses of the participants involved in the

sample were the representative of those of Higher Secondary Schools, constituting the population of the current study.

### 1.11 Delimitation of the Study

Jammu & Kashmir is a very large state with 22 districts. The present study was to be conducted only in District Anantnag as it is the second largest district in Kashmir. All Higher Secondary Schools in the district are under consideration of the study. Due to the prevailing conditions of Kashmir valley it is not an easy task to collect data from such a disturbed area. The reasons for selecting only one district is that, in J & K state all districts have same methodology, curriculum , infrastructure selection procedure of teachers, same teaching methods etc. so from the whole population of (J & K) the sample has been collected only from Anantnag District.

The data of the current study had been assembled in the year (2011). And the samples were delimited to Higher Secondary Schools, Students of HSS and Teacher of HSS.

### 1.12 Organization of the Study

The whole study restrains on the five chapters:

Chapter I incorporates introduction, the significance of the study, justification of the study, a statement of the study, definition of the terms used in the study, objectives, hypothesis, assumptions, delimitation of the study and the organization of the study.

Chapter II provides the survey of related literature which is elaborated in two sections.

Chapter III includes details of methods, sample and the strategy of the collection of data with a plan of analysis.

Chapter IV is devoted to the discussion of the analysed data.

Chapter V provides the summary, conclusion, implications, recommendations for practices and the suggestions.

## REFERENCES

Agyemang, B. K., & Dadzie, P. (2010). Providing Information Communication Technology support to distance education students, in university of Ghana, Legon. *Turkish Journal of Distance Education TOJDE, 11*(3), ISSN: 1302-6488.

Ali, M. M. (2012). Major issues of ICT integration in school education in India. *Proceedings of First International Conference on Innovations and Advancements in Information and Communication Technology, Noida, Vol. IV,* ISBN 978-93-81583-34-0. New Delhi: Excellent Publishing House.

Babila. M. T. (2010). The impact of ICT on students study habits. Case study: University of Buea, Cameroon. *Journal of Science and Technology Education Research, 1*(5), 107-110. Retrieved from http://www.academicjournals.org/JSTER

Blease, D. (1986). *Evaluating Educational Software.* Crown Helon, 51 Washington Street, Dover, New Hampshire, 03820, USA.

Bless, C., & Higson- Smith, C. (1995). *Fundamentals of social research methods: An African perspective*. Cape Town: Juta and Co, Ltd.

Blurton, C. (2002). *New Directions of ICT-Use in Education.* Retrieved from http://www.unesco.org/education/ educprog/lwf/dl/edict.pdf on 7 August, 2002.

Burki, S. J. (2007). *Kashmir: A problem in search of a solution.* Washington, DC: United States Institute of Peace.

Dabla, B. (2010). Sociological papers on Kashmir. In (Ed.), *Conflict situation and its impact Vol. 1* (pp-119). Jammu and Kashmir, India: Jay Kay Books.

Engler, D. (1972). Instruction technology and the curriculum. In F.J Pula and R.J.Goff (Eds), *Technology in education: Challenge and change.* Worthington, OH: Charles, A. John.

F.I.R (1995). Police Station Anantnag, First Information Report registered under FIR No.142. Dated: 12-05-1995.

F.I.R. (1993). Police Station Bijbehara, First Information Report registered under FIR No.117. Dated: 30-12-1993.

FOLDOC, Free online dictionary. *ICT (information and communication technology).* Retrieved from http://foldoc.org/Information+and+Communication+Technology.

Ganai, N. (2008). *Personal interview with the chairman of JK the board of school education [quoted: Hiba Arshad].* 20 June 2008. Retrieved from *www.kashmircorps.org.*

Government of India. (2012). 59th meeting of central advisory board of education ministry of human resource development 06- June, 2012 20:49 IST Press Information Bureau, 27th of December.

Government of Jammu & Kashmir. (2007). *Digest of Statistics*, Jammu & Kashmir. Srinagar: Education Department, Jammu & Kashmir.

Government of Jammu and Kashmir. (2009). *Director codes, Finance Department Notified Revised Pay Rules,* Vide SRO-93 Dated 15th April, 2009. Jammu/Srinagar: Rambir Government Press.

ICT Development Report. (2010). *ICT Development/ World Telecommunication Report,* International Telecom Union. World Summit on Information Society. Geneva Switzerland.

ICT in School Education. (2010). *Information and communication technology for education in India and South Asia, Essay II, ICT in School Education (Primary and Secondary).* by Info dev and Price White Coopers (PWC).

JKSBOSE. (2008). *Jammu & Kashmir State Board of School Education* (n.d.). Retrieved from http://www.jksboseonline.com on 1 October, 2008.

Le Roux, C. J. B., & Evans, N. (2011). Can cloud computing bridge the digital divide in South African secondary education? *Information Development, 27,* 109. Retrieved from en.wikipedia.org/wiki.

Liaw, S. (2002). An internet survey for perceptions of computers and the World Wide Web: relationship, prediction, and differences. *Computers in Human Behavior, 18.* 17-35.

Maheshwari, A. (2013). Crescent over Kashmir: *Politics of Mullaism* [Chapter 5: Myth of Negligence]. Rupa & Co. Retrieved from http://ikashmir.net/crescent/index.html.

Mansell, R., & Wehn, U. (1998). *Information Technology for Sustainable Development.* Oxford: Oxford University Press.

Merraim Webster Dictionary. *Secondary schools.* Retrieved from http://www.merriam-webster.com/dictionary.

National Policy on Information and Communication Technology (ICT) in School Education. (2011). Department of School Education and Literacy. *Ministry of Human Resource Development.* The government of India 2010. Revised Draft Dated 24.02.2011.

National Policy on Information and Communication Technology (ICT) in School Education. (2009). Draft version 1.5, Department of School Education and Literacy, *Ministry of Human Resource Development.* Govt. of India, (2009).

Nordic Council of Ministers, Statistics Denmark, Statistics Finland, (2002). *Nordic Information Society Statistics.*2002. Helsinki: Yliopistopaino.

Planning Commission. (2008). *Eleventh Five Year plan 2007-2012.*Government of India. New Delhi.

Planning Commission. (2011). *Faster, Sustainable and More Inclusive Growth. An Approach to the Twelfth Five Year Plan (2012-17),Government of India.* New Delhi: Indian Offset Press.

Report of the Education Commission (1964-66). *Education and national development.* Ministry of Education, Government of India (1st ed.). New Delhi: Govt. of India Press.

Report To The People (2011-2012). *UPA Government, Directorate of Advertising and Visual Publicity Ministry of Information and Broadcasting,* Government of India Compilation: Press Information Bureau Printed at Brijbasi Art Press Ltd., Noida. Retrieved from *mindia.gov.in/getdoc.php?id=xjhytm327.pdf.*

Rouse, M. (2005). *ICT (information and communication technology).* Retrieved from midmarket.techtarget.com/definition/ICT.

Rubab, S. (2011). *ICT & women empowerment: A case study on small scale service providers.* NIT Srinagar Jammu and Kashmir.

Sachdeva, M. S., & Gupta, V. K. (2003). *Essentials of instruction technology.* Jullandhar Ludhiana: Vinod publications (Educational publishers) Bright Press.

Selwyn, N., Gorard, S., Furlong. J., & and Madden, L. (2003). *Older adult's use of Information and Communication Technology in everyday life.* United kingdom: Cambridge University Press.

Shah, A., & Godiyal, S. (2009). ICT in the early years: Balance the risks and benefits. *Journal of all India Association for Educational Research, 21*(2).

Siraj-Blatchford., & Siraj-Blatchford (2003). *More than computers: Information and Communication Technology in early years.* London: The British Association for Early Childhood Education.

Status of Education in India National Report. (2008). Prepared by NUEPA. *Dept of Higher Education MHRD,* Government of India.

Tusubira, F. F., & Kyeyune, A. (2001). *What is Information and Communication Technology?* Tutorial paper, Library workshop Makerere university, ICT awareness workshop.

UNESCO (2007). The United National Educational Scientific Cultural Organization. *ICT in Education Programme*. Bangkok Thailand.

UNESCO. *HSS (higher secondary school).* Retrieved from http://portal.unesco.org/education/en.secondaryschool.

UNESCO. *ICT (information and communication technology).* Retrieved from: http://portal.unesco.org/education/en/ev.php-URL_ID=18645

Webster Dictionary: *HSS (higher secondary schools).* Retrieved from http://www.webster.com/dictionary

Wikipedia. *ICT (information and communication technology).* Retrieved from: The free encyclopedia. en.wikipedia.org/wiki/ICT.

Wikipedia. JKSBOSE (jammu and kashmir state board of school education). The free encyclopedia. Retrieved from en.wikipedia.org/wiki/Jammu_and_Kashmir.

Wikipedia. (Secondary Schools). The free encyclopedia. Retrieved from en.wikipedia.org/wiki/secondary_schools.

World Data on Education (2011). *Donees mondiales de l' education. Datos Mundiales de Education VIIEd.2010/11*.compiled by UNESCO.IBN/2011/CP/WDE/II UNESCO.IBE. Retrieved from http://www.ibe.unesco.org

World Education Report. (UNECSO,1998a). *Teachers and teaching in a changing world* (Summary) [On-Line], Paris. Retrieved from http://www.unesco.org/education/educprog/wer/wer.htm

Yusuf, M. O. (2005). Information and Communication Technology analyzing the Nigerian National policy for IT. *International Education Journal, 6*(3), 316-321.

# Chapter-2

# Survey of Related Literature

# CHAPTER-2

# SURVEY OF RELATED LITERATURE

# CHAPTER 2

# SURVEY OF RELATED LITERATURE

A crucial stage at the beginning of any research activity- undertaken to do one's own doctoral work, master's dissertation, action research – is examining what kind of studies have already been conducted in both one's own country or overseas, and what are their findings. A literature survey facilitates and enlightens to locate what research have already taken place; what variables and their relationships have been studied: and what remains to be done. The survey reveals what is called the 'research gap' or the areas which have been studied so far –or which had been studied in other cultures but not one's own. One may even like to find out if the variables that had been studied from one point of view or angle, need to be studied from a different angle or perspective. The most crucial purpose of review literature is the location of the major variables of the study and their existing relationships. The same phenomenon and its variables may have been studied by the different researchers from different angles. This will suggest how to refocus the angle or perspective for studying the same phenomenon, and select, if not the same but similar variables to further investigate the phenomenon under investigation.

The ultimate goal of review literature is to bring the investigation up-to-date with current literature and also help in forming the base of another target, such as upcoming research that may be needed in the area. Fink (1988), defined literature review as a systematic, explicit and reproducible process for identifying, estimating evaluating and interpreting the existing body of recorded work produced by researchers, academicians and investigators.

In order to elicit and explain, the whole chapter is fully elaborated into two sections: International and National Scenario. These two sections have been further divided into sub-sections.

*2.1 International Scenario*

2.1.1 ICT

2.1.2 Usage of ICT

*2.2 National Scenario*

2.2.1 ICT

2.2.2 Usage of ICT

*2.3. Critical Appraisal of Related Literature*

In organizing these studies an attempt has been made first to report those studies that have investigated ICT in relation to the any or several educational issues in schools and outside schools. These were followed by those researches that reported use of ICT in schools or in classrooms. The studies have been arranged in a chronological order.

## *2.1 International Scenario*

### 2.1.1 ICT

**Hardiman (1988)** studied the attitude of secondary school principals towards microcomputers, 331 principals in the state of Georgia were taken as a sample. A two part microcomputer assessment survey instrument was developed for this study. ANOVA, t-test and Pearson Product moment correlation were used for data analysis. It was found that the attitude of secondary school principals towards microcomputers were decidedly positive and their attitude was not influenced by variables like age, sex, degree level, school size, school system, experience etc. taken in the study.

**Hiltz (1997)** conducted a study on the impacts of college level courses via asynchronous learning networks: some preliminary results. The findings of the study reveal that online teachers must deliver information by merging active participation and interaction. Therefore, their roles have become supportive instructors. However, online instructions must understand the basic components of online learning to become active participants in electronic environments.

**Cifuentes and Shih (1999)** conducted a study in which they used American and Taiwan learners, indicated that e-mail was far more effective than synchronous communication for learning across a number of time zones. On-line learners and instructors use e-mail for their learning and teaching objectives. On-line educators also, can build a powerful relationship with learners by simply spending a few minutes each day to communicate with their learner via. e-mail.

**Cox, *et al.* (1999)** carried out a study examining the factors related to the uptake of ICT in teaching. A questionnaire was framed to collect evidence from teachers and other educators. The sample consisted of 44 male and 28 female computer-using teachers. The result showed that the teachers who were already regular users of ICT had confidence in using ICT, perceived it to be useful for their personal work and for their teaching and planned to extend their use further in the future. The factors that were found to be the most important to these teachers in their teaching were: making the lessons interesting, easier, diverse, motivating for the pupils and enjoyable. Additional more personal factors were: improving presentation of the materials, allowing higher access to the computers, giving more authority to the teachers in the school and making them more prestigious in administration.

**Moseley and Higgins (1999)** studied the attitude of a small sample of teachers. They brought into being that teachers who successfully made use of ICT had a positive rather than negative attitude towards ICT. Teachers who were having positive attitudes towards ICT itself would have been positively disposed towards using it in the classrooms. They found that teachers who successfully used technology in the classrooms had a positive attitude to ICT.

**Stiles (2000)** conducted a study on the effective learning and virtual learning environment, and found that the web has effectively made learning more distributed to provide the virtual learning environment. Stiles states that Virtual Learning Environments (VLEs) were "designed to act as a focus for the students' learning activities and their management and facilitation, along with the prerequisite of content and the resources that were required to help in the activities to make them successful". He also introduced Managed Learning Environment (MLE) as including, all of the students' records and profile keeping, the wider features of enrollment, course options

management, the wider management interchange and publication of content and features needed to allow learners to move or progress between courses and organization. The technically MLE's don't exist, which has been proposed by him despite the efforts of standardization to allow interoperability between VLEs.

**Richardson (2002)** conducted a study on ecology of learning and role of e-learning in the learning environment. He identifies that classroom model of instruction have numerous weaknesses including that it is separated from work based tasks and the emphasis on information. He also identifies that technology- based learning has focused too much on instruction and failed to provide effective social transactions. Richardson also introduced blended learning attempts to introduce technology-based learning and traditional classroom learning with simulated classroom delivery as an insufficient response to learner needs. He then suggests that "the ineffectiveness of these models is a result of failure to consider that people learn in many different ways and that learning is a part of everyday life and that people learn in response to need".

**Pitts and Kwami (2002)** conducted a study on raising student's performance in music composition through the use of information and communications technology (ICT) a survey of secondary schools in England. The sample of the study was 30 secondary schools. The data were collected with the help of questionnaire. The study revealed that the secondary school teachers were making use of ICT creatively to raise the pupil's performance in composing tasks. Significantly the mass production of keyboards has brought technological resource into the music classroom. Pupils were observed to be engaging themselves in many varieties of encounters, from pop based song composition to classical minute. The effective progress was observed when the unit of work was linked into prior musical learning of chord or song structure. All teachers related the task, back to pupil's music knowledge in some way. In some lessons pupil worked quickly to input their ideas and in some lessons they did not use ICT equipments to its full potential. The study revealed that very few teachers had time to develop fully study opportunities on the internet, where teachers record any views; they mention pupils having access to it as a 'search' for material. Only one school had resource material to support individualized learning.

**Tsitouridou and Vryzas (2003)** investigated the attitudes of early childhood teachers towards computers and information technology. The study examined whether the attitudes were differentiated by a series of factors or not differentiated by the series. The subjects of the survey were 107 in-service female early childhood teachers, taking part in the program of two years for in-service training department of early childhood education of the Aristotle University of Thessaloniki, Greece. The result indicated that early childhood educators had limited access and positive but temperate attitudes to the world of computers. Teachers' attitudes appeared to be influenced significantly by computer use at home, experience with computers and in-service training.

**Albirini (2004)** investigated the attitudes of EFL teachers in Syrian high schools towards ICT in education and to explore the relationship of teachers' attitudes with a selected set of variables. Teachers' attitudes were examined from two related frameworks: Roger's (1995) Diffusion of innovations and Ajzen and Fishbein's (1980) Model of Reasoned Action. A questionnaire was developed and distributed to 326 sample teachers selected randomly from the population. The survey method was followed by an in-depth phone interview with a purposeful sample of 15 teachers. Result from both quantitative and qualitative data indicated that the participants have a positive attitude towards ICT in education. While the participants had positive perceptions of the features of computers, they were relatively unbiased about the cultural relevance of ICT to Syrian society and schools. The teachers also reported lower levels of computer competence, access, and training. The significant and positive correlation existed between teachers' attitudes towards ICT and five independent variables: computer attributes, cultural perception, computer competence, computer access, and computer training. The Multiple Regression analysis indicated that only the first three of the independent variables had a significant predictive value of computer attitudes towards ICT. The result indicated that 0.58% of the variance in computer attitude was explained by the independent variables of the study.

**Guri-Rosenblit (2005)** worked on, "distance education and e-learning: not same thing in Higher Education". The study was conducted in Open University of Israel. The whole study explored the 'distance education' and 'e-learning' in higher

education setting. This article clarified that likely in the upcoming decade more and more providers of distance education will incorporate various forms of e-learning in their learning/ teaching apparatus. But even then the difference between 'distance education' and 'e-learning' will remain noticeable. The boundaries between 'distance education' and 'e-learning' will blur in some areas but they will never totally merge. Both phenomena will grow in future, but mostly for different reasons and in different directions.

**Magnusson, *et al.* (2005)** conducted a study on the impact of information and communication technology on family careers of older people and professional in Sweden. The sample of the study was 34 families who took part in the Swedish Action Project. The data were collected through questionnaire and interview. The findings of the study suggested that the scheme enriched the caring situation by facilitating the development and maintenance of informal support networks amongst the participating families. In contrast, action was less successful at targeting predictability and decision making in the caring situation. The lower predictability might be explained in the Swedish study by the slight educational content on planning ahead and decision- making. The findings also reinforce the importance of providing a range of support services, especially respite and other form of relief. And findings made it clear that the scheme was most effective when delivered at the earliest opportunity, for them it enables the career access to the information education and support services.

**Samak (2006)** explored factors that may influence the attitude towards information and communication technology (ICT) by Jordanian teachers of English as a Foreign Language (EFL). A sample 363 EFL teachers was taken with the help of random sampling. The data were analyzed using both descriptive and inferential statistics. The study illustrates that Jordanian EFL teachers had positive attitude towards ICT. They had a moderate computer competence and high access to ICT. It was also found that age of teaching experience had a negative correlation with attitude, whereas qualification had a positive correlation with attitudes. There was weak and positive correlation between training and attitude. Type of training, obtaining an ICDL certificate, and length of training was explored. Gender, teaching

methods and grade level were found not significantly correlated with attitudes towards the ICT. 64 % of the total variance in Jordanian EFL teachers' attitudes towards ICT was explained by the four main independent variables of the study- attributes, cultural perceptions, access and competence.

**Petros (2007)** developed and tested psychometric properties of a computer attitude scale for Greek population. A Greek Computer Attitude Scale (GCAS) of 30 items, with three subscales- confidence, affection and cognitive were developed. The study also explored sex difference on the GCAS and the relationship between the age, the computer experience, the confidence with computers and participants' responses on the scale. Questionnaire was used to collect the data from the four Greek samples, which included participants (185 and 354 from general population and individuals respectively), (222 teachers) and (99 undergraduate students). The result indicated that: (1) both reliability (internal consistency and test-retest) and validity (concurrent) of the GCAS were adequate; (2) the relationship between age and computer attitude was not significant whereas the sex did not have a significant effect on computer attitudes scores; and (3) perceived computer experience and confidence with computers were strongly related to favorable attitudes towards computers.

**Ololube, *et al.* (2007)** have examined ICT and distance education programs in Sub-Saharan African country a theoretical perspective. The sample of the study was Distance Education Programmes in Nigeria. The data were collected by using a combination of observation, document materials and the text- books, articles and reports were taken as the central materials. The finding and the nature of the study contains implication of distance education administrators, teachers and researchers. At a broad management level, this study describes an effective policy to make a balanced investment in the distance education programs and provide resources needed to effectively implement the use, integration and diffusion of ICT in distance learning rather than paying lip services. As such it has relevance for federal and state governments in developing economies. From the research methodology perspective, this study was portrayed by a number of limitations. The study found, the high hopes and enthusiasm for open and distance education, the nation is faced with inadequacies

of essential services such as infrastructure, electricity, postal and telecommunication services and so on.

**Vekiri (2010)** conducted a study on socio economic difference in elementary students' ICT beliefs and out of school experiences. In this study he explored the possible links between student's SES and beliefs about information and communication technologies. Grade 5 and 6 students (N=345) who were enrolled in one private and six public elementary schools in Greece, located in the areas having different demographic features, responded to questionnaire addressing their, ICT efficiency and value beliefs, perceived parental support and regulation of home ICT activities and support beyond the family to access the technological sources. The findings revealed that students from all SES family backgrounds tended to have positive views about the value of ICTs, but students who belong to the low SES families expressed lower confidence in their ICT skills. Conversely, students from low SES families appeared to have fewer opportunities to develop ICT competencies, which were able to explain, why they expressed low positive self-efficacy belief.

**Canvas, *et al.* (2009)** investigated the science teachers' attitude toward ICT in education and explored the relationship between teachers' attitude and factors which were related to teachers' personal characteristics (the gender, the age, and the computer ownership at home, and the computer experience). In order to collect data, an instrument (STATICTE) was developed by researchers and administered to 1071 science teachers almost uniformly distributed in 7 geographical regions of Turkey. The data were analyzed with the help of descriptive statistics and were used to summarize the properties of the mass of data collected from respondents. The results indicated that Turkish science teachers have positive attitudes towards ICT and although teachers' attitudes towards ICT did not differ with gender, it differed with age, computer ownership at home and computer experience.

**Babila. (2010)** conducted a study to investigate the impact of information and communication technology on students study habits. The research was carried for the two foremost purposes- firstly, to examine student's familiarity and attitude towards ICTs and secondly, to examine the possible relationship between student's use and study habits. The study was based on survey research design and the sample technique

used was the proportionate stratified random sampling technique and consisted of 100 CST /Biology students for the 2009/2010 academic years, out of 186 students in the department of CST/Biology, faculty of Education .The directly delivery method was to administer the questionnaire so as to have a high rate of questionnaires. The result revealed that the students had a positive attitude towards the ICT Usage and helps them in their studies. As such students constantly change their study habits based on the type of ICT they used to case studies.

**Agymang, *et al.* (2010)** conducted a study on providing ICT support to distance education students and investigated the current state of information and communication technology policy of the university of Ghana Distance Education (DE) program. The samples of the study were 120 DE students, the coordinator of the DE and 5 workers at the DE unit. The questionnaires were used to collect the data. The main findings of the study revealed that there was a policy statement on providing ICT-based support for the DE learners; however, this policy has not yet been executed. Most of the DE students were completely aware of ICT and the majority of them were using the internet across the regions. The students had a positive attitude towards ICTs in that they deemed it necessary in the course of their studies and were willing to pay for ICT services. The main obstacles identified that could affect the usefulness of the various ICTs were electricity, cost and accessibility. The study recommended among others, the forging of partnerships between distance education programmes and ICT companies, the networking of DE centers and the use of diverse ICT facilities, among others.

**Nelson (2010)** has investigated the ICT and educational performance. This original data-based study has been set out to measure the use of the internet as an information and communication tool in promoting educational performance and knowledge of Covenant University undergraduate students and to analyze the interrelationship of selected social and demographic and other relevant variables. The sample of the study was the academic session 2008-2009 of Covenant University. The sample size was 378 which were derived from a population of 7000 undergraduate students. The questionnaire was used as a data collection instrument. The study revealed that 262 respondents (80.4%) indicated that the internet drives knowledge in

the 21st century, while as 46 respondents representing 14.1% disagreed. In addition, 234 respondents (71.6%) revealed that they had adequate knowledge of the use of the internet, while 23 respondents representing 7.0% revealed that they did not have adequate knowledge of internet. Furthermore the study revealed that 251 respondents (76.5%) had both internet access at home and at school, while 31 respondents (9.5%) revealed that they didn't have access at home or in school. The study also revealed that 295 respondents made frequent use of the internet while 14 respondents argued that they did not have frequent usage of internet. This study also revealed that internet is an important resource for manpower development as well as educational performance and research. In addition, the efforts require to be made to ensure that universities and school of higher learning were ICT driven. In essence, if students and scholars have access to the internet, academic performance is produced.

**Donnelly, *et al.* (2011)** attempted a framework for teachers' integration of ICT into their classroom practice. The study initially involved interviews with seven science teachers and six educational stakeholders. This work describes attempts to integrate an ICT-based resource (a virtual chemistry laboratory) into some science teachers' practice within the Irish education system. From these experiences a working structure has been developed to describe the teachers' level of ICT integration into their practice and the feature underpinning this. The structure raises important questions about how teachers may be effectively supported to budge between descriptions surrounded by the framework. It also highlights the need to modify attempts to incorporate mixed strategies for mixed teacher stances on ICT integration.

**Tasir, *et al.* (2012)** conducted a study on relation between teachers' ICT competency, confidence level and satisfaction towards ICT training programmes: a case study among postgraduate students. In their study they used the questionnaire method to collect the needed data from the teachers. The samples were the postgraduate students, who were currently teachers of Education Faculty in Malaysian schools, in one of the universities located in the state of Johor. A total number of 184 questionnaires had been collected and then analyzed. This research finding revealed that Malaysian teachers had a high level of ICT competency, confidence level in using

ICT and satisfaction towards ICT training programs. The findings also showed that the correlation coefficient between teachers' ICT competency and teachers' confidence level in using ICT was high. However, both correlation coefficients between teachers' ICT competency and teachers' confidence level in using ICT with a teachers' satisfaction toward ICT training programs were moderate.

### 2.1.2 Usage of ICT

**Nikolaus (1985)** assessed the attitude of Tennessee teachers towards computers in classrooms. The relationship of present usage of computers to affluences of school districts, school level, gender, the teaching area, the years of education and the years of experience were examined. The sample of the study was 586 teachers in 18 randomly selected public schools in Tennessee. The attitude of these teachers was inferred by their responses to items on a questionnaire developed by the researcher, 350 usable questionnaires were returned. In analyzing the data, the chi-square test and the 0.5 level of probability were utilized to determine significance. The findings were:

(1) Teachers viewed instruction computing to be an enduring educational innovation and felt that computer experience should be provided to all students.

(2) The teachers observed instructional computing as being motivating for the students but they were undecided, pertaining to the effect of instructional computing on students' achievement.

(3) Though teachers expressed a lack of confidence in their ability to use computers in their classrooms, they indicated an elevated level of interest in receiving instructional computing in-service training.

(4) Of the variables examined in the study, present or no usage of computers by teachers seemed to have the greatest influence on their attitudes towards computers.

(5) With regard to present usage, at the elementary level, and with a moderate amount of teaching experience (8-15 years) were significantly most inclined to be presently using computers in their classrooms.

**Rosen and Weil (1995)** examined "technophobia "as an explanation for the low level of computer utilization,171 Elementary teachers,117 secondary science

teachers, and 200 secondary humanities teachers in 54 schools across five urban school districts completed three measures of technophobia and a measure of demographic characteristics, computer experience, computer availability, and current computer use. In this study it was found that the computers are available in all schools and many teachers were technophobic particularly elementary teachers and secondary humanities teachers. Most of the teachers were worried about dealing with the actual computer machinery in their classrooms, about computer errors, and about learning to use computers; and predictive models showed that although computer experience was the most prominent predictor of a technophobe, it was not only the predictor-age, the gender, the teaching experience, the computer availability, the ethnicity, and the school socio-economic status also plays an important role in predicting technophobe.

**McCarthy (1998)** focused on the attitude of New York City teachers of special education toward the use of computers and their usefulness in educating students with disabilities. The researcher also wanted to examine if a significant relationship existed between the teachers' attitudes towards computers and their level of involvement with computers. The researcher constructed a demographic survey sheet along with a Like Scale-based survey instrument together data on the sample and their attitudes towards computers. The survey and demographic questionnaire were distributed to 150 New York City public school special education teachers. Based on the results of an item-by-item analysis of demographic questionnaire and survey instruments combined with a statistical analysis of relevant variables, it was found that the sample had positive attitude towards the use of computers in special education. This study also found that there was a significant relationship between the attitude towards computers and the level of involvement with computers.

**Box (1999)** designed Teachers and Technology: A snapshot Survey (Version 3.1) to ask teachers directly about their classroom technology related needs and beliefs. It includes demographic questions, a Likert- like section on beliefs, a 5-point scale of urgency of technology needs, questions about students and instructional time using computers and a stage of technology adaptations self assessment. The survey was distributed at a meeting at the high school in the north Texas town. A total of 97 surveys were collected of which 72 (74%) were high school teachers. The sample

contained 39 (40%) males and 54 (56%) females. Findings showed that while there were computers in about half the classrooms at this high school, many teachers did not plan for students' use of technology. They had sufficient motivation but did not believe that they have the tools or skills to integrate technology into the curriculum.

**Gray and Souter (2002)** examined the impact that the initiatives were having on ICT use in secondary schools i.e. the use of the ICT in secondary subject area, the perceptions of teachers in these areas. From the survey, returns were received from 393 teachers. A comparison of science teachers' perceptions was made with the teachers from other disciplines. Examination of the data indicates that, relative to other subject teachers, science teachers were found out to be positive with regard to use of and confidence of ICT. However, in absolute terms, although the availability of computing facilities was reportedly quite high, the actual level of use was quite low. In addition, where level of use was higher, it was regarded to a rather narrow range of applications, particularly word-processing. Although there appears to be an awareness of the potential for ICT in science, teachers pointed out that they did not use the introduction of ICT radically changing the way in which teaching took place, nor changing the teacher-student relationship. Science teachers were practically confident in their use of ICT but felt that they needed much more in the way of support and professional development to maximize their use of ICT in the classroom.

**Demetriadis, *et al.* (2003)** conducted a study on teachers' acceptance or resistance attitudes towards the infusion of technology into schools. The study showed that teachers were interested in using ICT to attain a better professional profile only to take advantage of any possible learning benefits offered by ICT but always within the context of the school's culture. The authors argued that introducing ICT into schools was seen as initiating a "negotiation" process where lower level goals may be altered to preserve what were perceived as goals of higher order. Teachers' attitudes to adapt the ICT mode of use were supported by research evidence that emphasize the situational character of knowledge and expertise. The authors proposed that teachers' training should be combined with action that advances school epistemology towards a multiple context learning perspective. Such an extended action might be the

establishment of extended learning communities that would help to bring together school learning context and learning activities.

**Selwyn, *et al.* (2003)** conducted a study on older adult use of information and communication technology in everyday life. The sample of the study was 1001 adults and the age distribution was 352 respondents whose ages were 60 and more years, 319 whose ages were 41-60 years and 330 whose ages were 21-40 years. The data were collected by interview. The findings of the study revealed that the higher prevalence of ICT use by older adults and age continued to be an important factor in determining people's use of information and communication technologies. The findings also revealed that only 15% of older adults made use of the internet over the past 12 months. The study also indicated that older adults used computers mainly in home and where the support was available, it was mainly from the immediate household and relatives. The sustained use of computer by older adults in public sites such as libraries, community centers and internet cafes was not in evidence as well as being a minority activity amongst older adults using a computer is also highly stratified by the gender, the age, the marital status and the educational background.

**Matthiasdottir, *et al.* (2003)** focused on the use of ICT tools, by the teachers their attitudes towards the use of ICT in teaching and how it relates to their teaching. The research study was conducted in 14 Icelandic schools and one Private School. The response rate was 47% or 423 answers out of 906. The questionnaire was developed for this study in 2002 by the authors. The main findings of this study were that the use of internet was quite common among Icelandic high school teachers. Teachers searched the net for materials to use in their teaching and send and receive students' projects and essays. Teachers were positive towards ICT use as most of them (81%) agreed that it was preferable to use computers in teaching, but were not widely taking advantage of the range of opportunities ICT offers, such as interactive exams and web discussions. Nor were they convinced that the use of ICT in teaching will lead to better student outcomes.

**Erkan (2003)** conducted a study on teachers' attitude towards the computer technology use in vocabulary instructions. The study examined whether and to what extent the opportunities, the facilities, and the training provided to teachers contribute

to their acceptance and use of these resources. The data was collected through questionnaire distributed to 97 teachers. Based on the result of questionnaires, the sampling technique used was a stratified sample of 12 teachers which was selected for follow-up interviews. The questionnaire results revealed statistically significant difference between teachers who had undergone computer technology resources in language teaching. Report on interviews was used to establish whether positive attitudes or interests led people to undergo training or the reverse. The results also showed that simply introducing computer technology resources does not guarantee teachers' use of these in practice. The provision of training was seen as a key factor in both changing attitudes and encouraging teachers in incorporating technology into their instruction.

**Karadag (2003)** conducted a survey analysis on Application of Computer Aided Mathematics Teaching in a Secondary School. The students of NPO School were given lectures in the classroom, one of the sections was additionally given CAT with commercially produced softwares and the other section was given teaching materials that were prepared by the teacher. In order to identify the effects of different methods used in mathematics teaching, the total sample comprised of 78 students, from the school which were classified homogeneously into three groups. The findings of the study were:

1. Computer Aided Mathematics Teaching, in totaling to classroom teaching, could give a better learning environment by means of:
    a. students to understand abstract concepts than only classical classroom teaching even if in computer laboratory or Audio-Visual Room.
    b. teachers so that it provoked the potential and provided a better educational experience.
2. In addition to existing educational software, presentations prepared by teacher with MSPP slides, would be beneficial.

**Ayman and Cenk (2004)** conducted a study on the implications of the integration of computing methodologies into conventional marketing research upon the quality of students' understanding of the concept. The sample was 96 students

with the population size 486. Out of 96 students surveyed with 1 missing value 41 students (43%) learned marketing research subject on theory only through their core marketing course, 54 students (57%) learned application through computing for marketing research additionally through their marketing research classes. A detailed study to enable the comparative evaluation of the understanding of students within the communication faculty regarding a major area of trade and media industries for marketing research was aimed. For this purpose two groups were traced, one getting the prerequisites of marketing research only on the theoretical basis during the marketing courses and the other learning the concepts through a marketing research course equipped with computer application practices. The main findings of the study were presented in a comparative display format to enable ease of understanding. Also the methodology of both the courses will be presented to serve as a guideline for academicians who were interested in the integration of innovative computer application facilities into their conventional theory based course formats.

**Usun (2004)** conducted a study on undergraduate students' attitude on the use of computers in education. For a survey method the questionnaire was administered to 156 undergraduate students from two departments, 90 were from one department and 66 were from the other department .The results of this study showed that the mean score for students of computer and educational technologies was higher than the mean score for students of educational sciences. This was correct for (8) of the (9) attributions. If we consider the fact that the students of Computer and Educational Sciences because of their department and lectures work more in the computer environment and benefit more from these tools in education, this result may be very normal. According to the top 5 attributions ordered by students as computers: (i) individualize learning, (ii) is self-paced, (iii) allow the students to work privately, (iv) are fun and entertaining, and (v) are excellent for drill and practice. These attributions were the reasons of using the computers in education. We found (9) an attribution in which there was a statistically significant difference between the two groups.

**Sadik (2006)** examined the Egyptian teachers' attitude towards personal use and school use of computers. The data were collected from the sample of 443 teachers. It was observed that overall, the teachers had high score on the attitude scale

but male teachers had more positive attitudes than female teachers. Moreover, teachers who had positive attitudes towards their personal use of the computers also felt positive towards the use of computers in schools. Trained teachers expressed more positive attitudes towards the importance and usefulness of school use of the computer and had higher confidence than did non trained teachers. Also, teachers who had long teaching experience were more likely to appreciate the importance of computer use of schooling.

**Wozney, *et al.* (2006)** conducted a study on implementing computer technologies: teachers' perceptions and current computer technology practices among 764 elementary and secondary teachers from both private and public school sectors in Quebee. Using the expectancy-value theory, Technology Implementation Questionnaire (TIQ) was developed. In addition to this the teacher demographics, availability of the resources and teachers' current uses of technology were also surveyed. The findings of the study were:

(1) expectancy of success and perceived value were the most important issues in differentiating levels of computer use among teachers.

(2) personal use of computers outside of teaching activities was the most significant predictor of teachers' use of technology in the classroom; and

(3) teachers' use of computer technologies was predominantly for "informative" (e.g., World Wide Web and CD-ROM) and "expressive" (e.g. Word processing) purposes.

**Kiridis, *et al.* (2006)** elucidated the perception and the attitude of Greek teachers towards the use of ICT, and explored the potential of the integration of new technologies in public primary education. The sample consisted of 951 primary school teachers from all over the country. The results revealed that although the majority of the respondents believe that ICT was a useful tool for teaching and learning, and generally agreed with its exploitation in schools, it appeared that they were not yet fully conceived about the advisability of the immediate introduction of new technologies in primary education.

**Yunus (2007)** has conducted a study on Malaysian ESL teachers' use of ICT in their classrooms: expectations and realities. The sample of the study was 530 ESL teachers at 75 technical schools in peninsular Malaysia. The data were collected with the help of questionnaire and a survey followed by a semi- structured interview of school teachers'. The findings of this study revealed that the majority of teachers agreed that using ICT in language teaching helps their students to understand English. Some teachers considered the usage of ICT as wastage of time. The findings were consistent with other evidences that teachers were not being adequately prepared to integrate ICT into teaching. One of the main challenges of ICT integration perceived by ESL teachers in this study is teachers' low level of access to school computers which might have played a role in teachers' modest computer competence, so essential to future computer use. This implies that ICT initiatives should include measures for preparing teachers to use computers in their teaching practice. Teachers' preparation necessities were not merely providing additional training opportunities, but also aiding them in experimenting with ICT before being able to use it in their classrooms.

**Ogunkola (2008)** investigated the effect of computer attitude, the ownership and the use on the computer literacy of science teachers in Nigeria, 129 science teachers drawn from the four political divisions of Ogun State, Nigeria were used for the study. The two valid and reliable scales- computer attitude, ownership and use scale and computer literacy self assessment scale were used to collect the needed data. Percentage, standard deviation and multiple regression statistics were employed for data analyses. In this study the findings revealed that the science teachers had a positive attitude towards computer. Also, computer attitude, ownership and frequency of use jointly predicted the science teachers' computer literacy with the influence of computer ownership being the highest when considered individually.

**Adeyemi and Olaleye (2010)** have conducted a descriptive study to investigate the use of Information Communication Technology (ICT) for effective management of secondary schools in Ekiti State Nigeria. The sample of the study consisted of 160 secondary schools, selected through stratified random sampling. Out of the 6,278 teachers in the schools, 812 teachers made up 160 principals and 652

teachers. A questionnaire was used for the collection of data and the data were analyzed by using percentage, frequency counts and Pearson product moment correlation analysis. The findings of the study revealed that the level of provision of ICT equipments to secondary schools in the state was low. The level of the principal management of schools was also low .The intermittent disruption of electricity and inadequate findings were found as major problem inhibiting the use of ICT equipments for the management of schools in the state.

**Samah (2010)** conducted a study on computer use by Secondary School Principals in University Putra, Malaysia. The sample of the study was 320 Iranian Secondary School principals in the province of Teheran. The data were collected from a set of questionnaire. The findings of the study indicated that about 51.6% of the respondents were males and more than half of the respondents 50.3% were within the range of age up to 45-54. About 44.7% of respondents had 21 or more years of experience. There were 53.1% of respondents who worked in private schools and respondents having a bachelor's degree were 60.3%. The findings also revealed that that 95.5% had computer training and 83.8% of them had more than 60 hours of training. More than half of the principals participating in the study 52.8% reported that they received their training through in-service trainings. The findings of the study revealed that most of the respondents used a web browser, a few times a week to investigate professional and educational resources. The attitude of the principals towards ICT was positive with an overall mean of 4.05 and a standard deviation of 0.44. From the finding it can be concluded that principals who have positive attitudes towards ICT in education use computers in their administration and instructional task once computers become more available to them.

**Hashim, *et al.* (2010)** have conducted a study on accessing the attitude of distance learners towards the use of ICT in education Shah Alam, Selengor Malaysia. The sample of the study was 500 students and the data was collected with the help of a questionnaire which has been distributed among the adult students of distance education. The findings revealed that the anxiety had the highest mean score of 28.87, followed by the linking, confidence and usefulness. The findings also revealed that there was no gender discrimination towards ICT and working with computers as

neither male nor female students had any reason not to embrace ICT in their daily work. The age was not a factor that inhibited the students' usage of ICT. The findings also indicated that the level of computer skill did not exert a positive influence on any of the four attitudes and there was no relationship between qualification and four attitudes.

**Aypay (2010)** conducted a study to examine the ICT usage and academic achievement of Turkish students in PISA 2006 data. In the study 4942 students were selected as a sample from 160 schools. Frequencies, independent samples, t-test, ANOVAs, Pearson correlation coefficients, regression analysis and exploratory factor analysis were used. The findings of the study revealed that a high percentage of students accessed the computer and the computer was utilized for software purpose, entertainment purpose and internet purpose. The findings also revealed no significant relationship between students' ICT skills and academic achievement among Turkish students and found to be similar in general PISA findings; SES findings indicates the difference in the gender. The male students had higher opportunities to access computer in other places except school and home than the female students. In the sample very frequent use of ICT did not necessarily improve students' performance in PISA. Another finding of this study depicted that the mothers' and fathers' educational level went down when SES difference were examined and the use of computers for software purpose increases. There was a negative relationship between mothers' and fathers' educational level and the computer usage.

**Wiken and Molster (2011)** conducted a study on Norwegian secondary school teachers and ICT. The study explored to what extent teachers use of ICT in their classroom teaching and what teacher level factors influence the use of ICT .It drew the analysis of 10 focus-group interviews with 10 teachers and a quantitative study of 59 teachers in three lower secondary schools in Norway. The teachers showed pledge to ICT; however, they did not see the educational value, only except the increased access to learning material and to stimulate learner motivation. The teachers lack ICT confidence, even though they have been participating in ICT courses. The main finding of the study was, to incorporate the ICT in one's own

teaching was difficult and a gradual process and teachers must be given time to find their own way to merge ICT with their own teaching style.

**Hakverdi-Can and Dana (2012)** investigated exemplary science teachers' use of technology. The middle and high school teachers who received the Presidential Award for Excellence in Science Teaching Award were taken as a sample. The survey response, analysis pointed out that the exemplary science teachers have a bulk of knowledge/skills in using computer related applications/gadgets/tools. Among which the most commonly used computer applications/tools are information retrieval via the internet, the presentation tools, the online communication, the digital cameras, and the data collection probes. As per the revealed results of the study, the students' use of technology in their science classroom is highly correlated with the frequency of their science teachers' use of computer applications/tools.

**Porta, *et al.* (2012)** conducted A Delphi study on Technology Enhanced Learning (TEL) applied on Computer Science (CS) skills. The method applied for this particular research is called Delphi. The Delphi method consists in selecting a panel of experts in the studied field (in our case TEL), and investigates a subject using different rounds of questions. Three-rounds of online survey questions, was given to 17 TEL experts from different European countries. The result confirmed that those proficient consider TEL an effective and interesting who support to acquire CS skills. In addition, the findings exposed the five best tools in TEL to acquire necessary CS knowledge. The research in the future can provide a guideline to implement effective TEL tools in CS studies.

**Ozgen and Bindak (2012)** investigated the examining student opinion on computer use based on the learning style in mathematics education. As a sample, 388 high school students were included in the study. The data collection instruments were, learning style inventory, questionnaire form and interview questions. The content analysis was used in analyzing the qualitative data and frequency, chi-square and percentages were used in the analysis of quantitative data. The results of the study confirms that students with a diverge and accommodator learning styles have more positive opinions regarding computer use in the mathematics education compared to the students with assimilator and converge learning style.

**Utulu (2012)** conducted a study on the use of mobile phones for Project Based Learning (PBL) by undergraduate students of Nigerian private universities. The study was carried out to evaluate the use of mobile phones by students involved in PBL in three randomly selected private universities in Nigeria. The questionnaire was used for data collection from 750 undergraduate students distributed across the three selected private universities in southwestern Nigerian states. This is to say that 250 students were sampled from each of the participating private universities whose population was estimated to be about 2000 students each. The result showed that a significant percentage of the students studied had mobile phones and that they used their mobile phones for communication, getting information, interactions, browsing of the internet, and giving out or sharing the knowledge anytime and PBL was involved. It was also revealed that mobile phones can be used to strengthen PBL in higher institutions and can be used to implement information services provided for students in their universities. Although private universities in south western Nigeria amounts to about 43.9% of private universities in Nigeria, it is a percentage that makes them to be an extensive representation of private universities in Nigeria. The generalization was made on the basis of the fact that the study sampled population was drawn from only three southwestern Nigerian based private universities, as the situation in Nigeria is appropriate. The study however, provides primary information on the prospects, gains and challenges mobile phones offer as an appropriate educational technology for implementing PBL in Nigerian universities.

## *2.2 National Scenario*

### 2.2.1 ICT

**Seth (1983)** conducted a study of the effectiveness of educational television on the educational development of primary school children, PhD Edu., MSU. The sample of the study was 1450 primary schools run by the Delhi Municipal Corporation. Ravens colored progressive, matrices, tests for language development by Shula and Kumar, achievement tests, test based on ETV programs, a pro-forma for teachers developed by investigators and an interview schedule was used in the study. The findings of the study revealed that the language development of children exposed to ETV was higher than those not exposed to ETV. Language development among

children exposed to ETV along with intervention programs was higher than those exposed to ETV alone and those not exposed to ETV. The ETV group was found higher on acquisition of information related to ETV programs than the non-ETV group. The ETV group with the intervention was found higher on acquisition of information related to ETV programs than those exposed to ETV alone and those not exposed to ETV. The scholastic achievement of students exposed to ETV programs along with the intervention was higher than the ETV and the non-ETV groups. The important implications of the present study are: (1) teachers should be trained in the proper utilization of ETV programs and guidance notes should be sent to them for each program well in advance. (2) if more programs related to the syllabus are telecast it may contribute more in the achievement in school subjects. (3) teachers of primary schools and producers of ETV programs for primary schools should work as a team and decide the content, presentation, etc. of the program.

**Sahni (1999)** conducted a study on gender difference in achievement in computer science. The sample of the study constitutes of 479 senior secondary male and female students. The variables of this study were gender, achievement in computer science and cognitive abilities. The main findings of the study were: (i) there was no significant difference in the performance of male and female students in computer science. (ii) the performance of male students was significantly superior to that of the female students on the cognitive abilities test of the algebra problem solving, the arithmetic problem solving, the spatial ability and the verbal reasoning. (iii) the performance of male and female students did not differ significantly on the other three tests namely procedure following, direction following and logical reasoning. This indicates that females were as likely to grasp programming concepts as males.

**Sultana (2001)** conducted a study on the attitude of IX class students towards computer and their achievement in science. The sample of the study was 200 students. The purpose of the study was to find relationship between computer attitude and religion of the students. The students were grouped into Muslim and Non-Muslim as per their religion. The results of the study revealed a significant difference between

two groups. Non-Muslim students showed greater computer attitude than their counterparts.

**Siddiqui (2002)** examined the attitude of secondary school students towards information technology. The variables used in the study were gender, religion, academic achievement, school type, parental education and occupation. The main findings of the study were:

(i) there existed a feeling of favorable attitude towards information technology among the majority of the students.

(ii) male students had more favorable attitudes towards information technology as compared to the female students.

(iii) muslim students had less favorable attitude towards information technology.

(iv) there was no significant difference in the attitude of secondary school students having high and low academic achievement towards information technology.

(v) AMU students had more favorable attitudes towards information technology as compared to non-AMU students

(vi) students of less educated parents had a favorable attitude towards information technology as compared to students of highly educated parents.

(vii) student whose father had a low occupational status had less favorable attitudes towards information technology as compared to student whose father had high occupational status.

**Sharma (2002)** studied the attitude of secondary school students towards information technology. The data were collected from 100 teachers who were selected from different schools of AMU. The data collected was analyzed with the help of chi-square test and t-test. The findings of the study were: 56% male teachers and 46% female teachers agreed strongly that the use of different electronic devices like computer, internet and e-mail services made their life enjoyable. 46% male teachers

and 56% female teachers were found to agree that the learning though is an individual activity to a much greater extent. The significant difference was not found between the attitude of male and female teachers towards a role of Information and Technology. 60% of male teachers and 50% of female teachers strongly agreed that internet services provided an opportunity to the students to know about the various universities throughout the world and the use of the technological devices were helpful in developing the confidence among the students.

**Annaraja and Joseph (2006)** examined the level of attitude towards ICT of teachers' trainees. The random sampling technique was used for selecting the sample of 13 male and 18 female teacher trainees from the teacher education center of MG University, Kottayam. Attitude Scale toward ICT was developed by the investigators which had been used as a tool to collect data. In analyzing the data, t-test and chi-square test were used. It was found that 54% of male teacher trainees have high levels of attitude towards ICT. 78 % of female teacher trainees have high levels of attitude towards ICT.68% of teacher trainees possessed a high level of attitude towards ICT. There was no significant association between attitude towards ICT and (a) fathers' educational qualification (b) mothers' qualification (c) fathers' income (d) family income.

**Sharma (2006)** conducted a study of the graduate students' attitude towards multimedia information technology in relation to their gender, religion, parental education and occupation. The sample of the study consisted of 250 secondary school students. The objective of the study was to find the relationship between students' religion and their attitude towards multimedia information technology. The result showed that Non-Muslim students had greater multimedia attitude than the Muslim students.

**Khan (2007)** studied the attitude of university teachers towards Information and Communication Technology (ICT) and the factors inhibiting its use in Higher Education. The data were collected from 150 AMU teachers and was analyzed with the help of t-test. The findings of the study showed that the level of ICT usage by the university teachers was satisfactory but there was little transfer of these competencies to teaching practices. The majority of the teachers had a favorable attitude towards

ICT usage. There was no significant difference in the attitude of the male and the female university teachers towards ICT. More experienced university teachers had more favorable attitudes than the less experienced teachers. Engineering faculty teachers had a favorable attitude than those of the other faculty.

**Mishra and Panda (2007)** described the process of the development of an empirically-based psychometrically sound instrument to measure faculty attitude towards e-learning. The attitude towards e-learning scale having 12 items was developed showing a high probability of differentiating between positive and negative attitude towards e-learning. However, the authors suggested that the scale may be used alongside a social desirability scale to reduce the limitations of attitude measurement.

**Vandana and Tanvi (2007)** conducted a study on the student attitude towards the use of IT in education. The study examined the success of technology and internet-enriched teaching and learning environment in attitude along with students towards using IT for learning at North Indian Engineering Institutes. Students were having computer facilities and required to complete compulsory generic course in IT and the lecture actively encouraged the use of IT in particular, internet in the teaching and learning process. The result clearly depicts that students have a positive attitude towards using the internet as a learning tool. The result also revealed the students were having adequate basic knowledge of internet.

**Rajashekar and Vaiyapuri (2007)** studied higher secondary teachers' computer knowledge and their attitude towards computer. The sample of the study was 670 teachers working in higher secondary schools situated in the Cuddalore district of Tamil Nadu, India. Computer knowledge test and computer scale was used as tools to collect data from teachers. The data were analyzed with the help of mean, SD, percentage-test and Pearson's Product-moment 'r'. It was found that 60.40% of teachers had relatively a favorable attitude towards computer and only 39.60% of them had relatively an unfavorable attitude towards computer. This trend was seen in respect of the sub-samples too. There was no significant difference in attitude towards computer between male and female teachers, between the teachers working in the urban and rural schools, between the teachers working in government schools and

private schools and between the secondary grade teachers and post graduate teachers. There was a significant difference in attitude towards computer between the secondary grade teachers and graduate teachers. Secondary grade teachers were better than graduate teachers in their favorableness of attitude towards computer. There was also a significant difference in attitude towards computer. There was significant and positive relationship between the computer knowledge and the attitude towards computer of the higher secondary school teachers.

### 2.2.2 Usage of ICT

**Mohanty, *et al.* (1976)** conducted a study on Educational Television Programs Telecast during the In-service teachers Training course, 1975, Directorate of Higher Education, Orissa, The sample of the study consisted of 113 teacher-monitors engaged for conducting the in-service training programs of teaching science for primary school teachers. A questionnaire was prepared and used for collection of data. The findings of the study revealed that, majority of teacher-monitors expressed positive reaction towards all the TV Programmes, 81 percent of the TV sets functioned well; the software materials of all the programmes were appreciated. Dubbing of TV programs in regional language was not appreciated. Black board was neglected .The trainees found it difficult to follow the programs on science topics which were not included in the primary school syllabus. Students' participation in the TV lessons was not up to the mark. The duration of 22.5 minutes for each lesson was not adequate .The work of teachers trained through the program was not supervised by inspecting officers.

**Chakrabarty, *et al.* (1982)** have investigated that the satellite Instructional Television Experiment – a study of Chhattisgarh NIRD. The sample of the study was adopted in one village for intensive study of four villages for the survey. The data were collected through the interview. The findings of the study revealed that one fourth of heads of household were regular viewers. Though the language used was Hindi but the local particular touch was missing .It seemed that the custodian of TV who was usually a teacher was not motivated and saw his duty as a burden. There was inadequate participation and involvement of local organization. There were conditions in which everyone felt constrained and which did not permit any effective dialogue

taking place between field level functionaries and SITE officials whose image, to local officials, was that of 'coming from the higher-up's and also there was an insistence on form rather than content in the programs.

**SCERT (1982)** examined 'An on the spot evaluative study on school broadcast program in the towns of Cuttack and Bhubaneswar in Orissa'. The samples of the study were 11 Upper Primary schools, eight Middle English schools and 39 schools from Cuttack and Bhubaneswar. A pro-forma was prepared and used for the collection of data. The findings of the study revealed that around 72 percent high schools, 13 percent ME schools and no primary school possessed radio sets. Sixty two percent of high schools had sets in working order. Twenty percent of high schools expressed inability to purchase radio sets due to non-receipt of circulars and non-availability of funds, only 15 percent of high schools had kept separate periods for school broadcasts. Only 10 per cent of the schools used radio programs regularly and made use of pre- and post broadcast discussion sessions. Forty percent of the respondents from high schools and 33 per cent of ME schools had pointed to lack accommodation and practice of a shift system as the difficulties in the use of school broadcast programs. Besides, a large number of schools had complained about non-provision of time table for educational broadcasting, inadequacy of radio sets, and non-receipt of circulars and lack of funds coming in the way of successful implementation of the program.

**Nagaraju and Usha (1983)** investigated school broadcasting: utilization by high schools in Bangalore district, ISEC Bangalore. The sample of the study was 85 schools. The data were collected with the help of questionnaire, checklist and interview. The findings of this study revealed that only six out of 33 responding schools made arrangements for listening to the radio broadcasts. About 30 schools had no seating arrangements for large-scale listening. Only six schools had made some arrangement in their timetable for radio lessons. Interviewer's visits to non responding schools revealed that no schools had made arrangements for listening. An analysis of listening facilities available in schools revealed that 27 out of 57 schools had radio sets in working conditions. Out of these only 16 schools had listening facilities either through an intercom or through loudspeakers. The rest had no

listening facilities. A majority of the schools reported non-working condition of radio sets. Further, schools reported difficulty in making proper seating arrangements.

**Rao (1984)** conducted a study of factors influencing the effective use of audio-visual equipments and materials in classroom teaching. PhD, Edu, SVU. The sample of the study was 8 schools and four types of questionnaires were used in the study. The major findings of the study revealed that the position of audio-visual equipments in the school was poor. The significant relation has been found between the availability of equipment and the type of the management of the school. There was an association between the availability of the audio-visual equipment in the schools and their locality. There was a relationship between the availability of the audio-visual equipment and the type of school. There was no positive association between the availability of audio-visual equipment and the strength of the school and between the effective or ineffective use of audio-visual equipment in classroom teaching and the type of management. There was no significant relationship between the effective use of audio-visual equipment in classroom teaching and the locality of the schools. The findings also revealed the 'absence of sufficient equipment and materials' as the first and foremost hindering factor for the effective use of audio-visual equipment and materials. The other factors hindering effective use of audio-visual equipment and materials, given in order of importance, were: 'heavy workload on the part of the teacher', 'lack of accommodation', 'lack of funds', 'lack of trained personnel', 'lack of time for the teacher' and 'expensiveness'.

**Goel (1985)** made a study on the educational television in India, organization and utilization, CASE, MSU. The sample of the study was organization of ETV in Delhi, Maharashtra, Srinagar, Jaipur, Raipur and Muzaffarpur and the utilization was studied in Maharashtra. The data were collected through the questionnaire and interview. The major findings were: Delhi was producing six programs per week for classes V to XI for the schools of Jaipur, Raipur and Muzaffarpur. In Delhi, TV handbooks were distributed to all TV viewing schools. In Maharashtra, TV handbooks and other support materials were distributed to all schools but they did not reach the schools in time. In Srinagar, Jaipur, Raipur and Muzaffarpur, support materials were not supplied to teachers. In Delhi and Maharashtra, script writers and

teachers were oriented whereas in other centers there was no similar program. In Delhi and Maharashtra, STV programs and/or support materials were produced by the ET cell of the Education Directorate. There was no program of preparing these in Jaipur, Raipur and Muzaffarpur. In Srinagar, the DDK produced the software. In Delhi and Maharashtra, teachers were oriented in utilizing the ETV programs for classroom instruction. Such orientation programs were absent in other centers. STV programs were properly evaluated in Delhi. In Maharashtra, there was no proper mechanism for the evaluation of STV programs. No systematic evaluation was found in other centers. Except in Delhi and Maharashtra, no systematic attempts were made to study the audience profile and to ascertain the needs of the users. In most of the centers, the synchronization of STV program scheduling and the school time table presented problems. In many centers, the program was urban-oriented. The several children found it difficult to understand the language of the presenters of STV program. In Raipur, Jaipur and Muzaffarpur, teachers had developed a hostile attitude towards STV. In Maharashtra, there was no provision for a school telecast period in the school time-table which reduced the degree of utilization. The programs in Marathi in Maharashtra presented problems of language to the multilingual student population in Maharashtra. Most of the students and teachers in Maharashtra had positive reactions towards STV programs.

**Sudame and Goel (1988)** made a study of school broadcasts in Baroda district, New Delhi. The study presented a happy state of affairs. However, it also pointed out some bottlenecks. One very good feature was that 85% of the schools had radio sets but only 1/5 of the schools provide for SBP in their time-table. Radio lessons were largely textual curricular centered. They need to move more towards enrichment type script writers who didn't receive any type of training. This is an important observation and the media managers should be the main takers.

**Antonysamy (1989)** conducted a study on teaching environmental concepts to school drop-outs through the videos and the charts. It was found that learning through screening or viewing of the video films was more effective than learning through charts.

**Giri (1990)** investigated the problems and prospects of school radio broadcast programs. He found that utilization of radio broadcasts was more in urban schools than in rural ones. Further, in the rural sector only $1/4^{th}$ of the schools had the provision of a separate period in the time-table.

**Idayavani (1991)** conducted a study on a video program on weathering and work of rivers in physical geography for higher secondary students. He developed two video programs, one on the weathering and another on the rivers, and made an investigation to see how viewing of the video programs effects their achievements. It was found that students taught by the video method, performed better than students taught by the traditional lecture method.

**Jeyamani (1991)** conducted a study on the effectiveness of simulation model of teaching through (CAI). He developed a Computer Assisted Instruction (CAI) package in physics for class XI students. The experimental group received, CAI and after the experiment it was found that the experimental group performed better on the post test. The differences were insignificant in terms of sex and medium of instruction.

**Singh, *et al.* (1991)** conducted a study on the teaching of mathematics: effectiveness of Computer Assistance Instruction (CAI) and conventional methods of instruction. In this study the effectiveness of Computer Assisted Instructions (CAI) in teaching mathematics was seen. The main finding of the study was that the students who used the computer scored significantly higher than those taught through the conventional method.

**Kapadia (1992)** conducted a study on the impact of the television on the learning students. In contrast to Joshi V.'s (1987), the study reported that the maintenance scores of the experimental group were better. The findings revealed that seventy per cent of the students opined that TV programs help them in self learning.

**Parhar (1994)** took up a study on effect of media on students' learning. It was found that out of 20 schools surveyed, only 4 were using school TV programs fully. Video and audio cassette players were not used. No teacher was found to be trained in the use of school TV programs.

**Mahajan (1994)** pursued a study on effectiveness of computer instruction for teaching singular and plural at II grade, and found that Computer Assisted Instruction (CAI) to be more effective than the traditional method.

**Joshi and Mahapatra (1995)** undertook a study relating to effectiveness of computer software. They found that students taught through a software package significantly did better than those taught through conventional methods.

**Kothari and Chowdhari (1995)** studied the impact of television programs on the behavior of students of different age levels, and they found that girls had more positive effect on their emotional and creative behavior than boys. As regards the impact of television programs on moral behavior negative effect was more than the positive one.

**Bhangoo and Sidhu (1997)** studied the impact of selected audio-visual aids on food and hygiene knowledge of secondary school students. They found that students taught with audio-visual materials performed better than the controlled group.

**Rangaraj (1997)** studied the effectiveness of Computer Assisted Instruction (CAI) in teaching physics at higher secondary stage. He found that Computer Assisted Instruction as Support System was much better than Computer Assisted Instruction as Individual Instruction. Retention also was higher when taught through Computer Assisted Instruction as Support System.

**Enigo (1997)** undertook Ph.D. work on a study relating to effectiveness of Instructor Controlled Interactive Video (ICIV) and conventional non-interactive video. He found that instructor controlled interactive video and conventional non-interactive video was more effective than lecture method, also ICIV was more effective than conventional non-interactive video. Irrespective of the difficulty level of the content area contained in ICIV, it was found to be more effective.

**Pradhan and Khirwadkar (1999)** conducted a study on computer education in the secondary schools from the city of Baroda. The sample was taken from 19 schools providing computer education at secondary level, two teachers and six to eight students were given an open-ended questionnaire and an information schedule to

collect data regarding the present status of computer education in their school. The results showed that most of the teachers and students felt that introducing computer education in school was a positive step as computer knowledge and teaching subjects like science and mathematics through computers would help students in improving their logic. Also the teaching of school subject through computers was found to have a significantly positive effect on the student's performance.

**Dey. B, *et.al.* (2005)** have conducted a study on Information Communication Technology (ICT) and teacher educators: an empirical study. The sample of the study was 200 teacher educators working in different teacher training institutions of U.P. The researchers developed a tool named as 'use of ICT in teaching inquiry questionnaire', with 15 alternate response type items. The objective of the investigation was to study the use of ICT in a teacher training institute of the teacher educators during their teaching. The data were analyzed with the help of percentage. The finding of the study revealed that the teacher educators used ICT like Working-models (32%), Slide-Projectors (30%), Computers (28%), Over Head-Projectors (23%), T.V. (21%) & Internet (16%) and it was found that less than (10 %) teacher educators were using DVD, Radio, LCD Projector, Film Projector, Video Camera and Epidiascope, whereas it was found that no teacher educator was found to be the user of Magic Lantern.

**Mishra and Panda (2007)** conducted a study on e-learning in a mega open university: faculty attitude, barriers and motivators and examined the attitude of faculty members from IGNOU towards e-learning and to identify barriers and motivation of e- learning adoption and use. Data for the study were obtained from the 150 full time faculty members of the IGNOU using the survey method. The findings suggested that extensive use of computers and e-mail had a high relationship with positive attitudes towards e-learning. The most significant hurdles perceived by the faculty included poor internet access by students and lack of training on e-learning, followed by the policy of the institutions on and design of instruction for e-learning. The important motivators included individual interest to use technology, intellectual challenges and sufficient provision for technology infrastructure.

**Bashir and Siddiqui (2012)** conducted a study on the usage of ICT by the students of higher secondary schools of Jammu and Kashmir. The sample of the study constituted 100 students (50 boys and 50 girls) selected by random sampling technique from higher secondary schools of Kashmir. The objectives of the investigation were (a) to study the usage of ICT by higher secondary school students (b) to find out the difference in the usage of ICT among the boy and girl students of higher secondary schools of Jammu and Kashmir. The data were collected with the help of questionnaire framed by the researchers themselves. The data were analyzed with the help of percentage. The findings of the study revealed that the usage of ICT by the students in the higher secondary schools of Jammu and Kashmir was very low. The findings also revealed that the usage of ICT by the boy students was higher as compared to the girl students.

**Bashir (2013)** conducted a study on the usage of ICT by female students in higher secondary schools of district Anantnag, Jammu and Kashmir. The sample of the study was 100 female students selected from higher secondary schools by using random sampling technique. The data were analysed with the help of simple percentage. The findings of the study showed that the usage of ICT by female students was very low. The study was concluded by considering that the ICT should be gender focused and the female students should be encouraged for the suitable usage of ICT in schools.

## *2.3. Critical Appraisal of Related Literature*

A critical analysis of the above mentioned studies gave rise to certain substantive exploration which needs to be tinted and highlighted for the sake of further investigation. Most of the studies either carried out in India or abroad supported multiple results leading to phenomena where the need of further research becomes imperative. In the area of Information and Communication Technology, it emerges that research studies are found to be conversational and mixed. Several researchers have reported that the teachers had a positive attitude towards the use of ICT (Moselley and Higgins, 1999; Matthiasdottir, et al., 2003; Albirini, 2004; Samak 2004; Khan, 2007; Canvas 2009), while as the studies conducted by (Vandana and Tanvi, 2007; Babila, 2010; Agymang and Dadzie, 2010) found that students had a

positive attitude towards ICT. In some studies researchers reported that the teachers had a positive attitude towards computer usage in schools (Mc-Carthy, 1998; Sadik, 2006; Ogunkola, 2008). Whereas, (Ozgen and Bindak, 2010) conducted a study in which he found that students had a positive attitude regarding computer usage in the schools. In continuation to this (Cox, et al., 1999; Gray and Souter 2002; Tasir, et al., 2012) reported that teachers had higher level of confidence in using the ICT for teaching, as against these studies conducted by (Nikolaus, 1985; Wiken and Molster, 2011) found that teachers expressed lack of confidence in using ICT. The research conducted by (Hashim, et al., 2010) asserted that there was no gender discrimination towards ICT whereas study conducted by (Apay, 2010) indicated the difference in gender.

Further researchers like (Pitts and Kwami, 2002) observed that secondary school teachers were making use of ICT creatively to raise the pupil performance in composing the tasks, whereas against this, (Kiridis, et al., 2006) found that a majority of teachers believe that ICT was a useful tool for teaching but they were not fully aware about the advisability of an immediate introduction of new technologies. These contradictory findings of various studies mentioned above inspired the investigator to conduct a study on ICT in higher secondary schools as there was a paucity of sufficient published literature in the area of secondary education that dealt with the usage of ICT in the schools.

Researches both at national and international levels have tried to relate ICT with different aspects such as education, teaching, attitude, performance, effectiveness, curriculum, classrooms, confidence, career, satisfaction, management, competency, technophobia, academic achievements, study habits etc. However there has been hardly any serious attempt to study the status and the usage of ICT in schools.

In recent past there has been revolution in various aspects of the educational sector with the advent of ICT in particular reference to conventional and modern tools. These technologies have been completely new to a vast majority of the schools, whereas the school teachers and students were becoming more familiar with ICT resources used in classrooms either modern or conventional. This warranted all the

teachers to learn, use and adopt the technologies so as to better understand the student's perspective to the exposure to a variety of ICT resources and development of concepts of the subject. It requires teachers to modify their method of collecting information and style of teaching so as to reach the majority of the students in a more effective manner.

More the usage of ICT tools, the better would be the quality of education. The students and teachers are not fully ready to imbibe ICT in the teaching and learning process, as its usage is very low, because the students were not provided the ICT facilities (Agymag, 2010). The government must improve the information technology as the education sector for manpower performance and skill acquisition. (Nelson, 2010). Research conducted on the use of ICT for effective management of secondary schools found that the materials were not vigorously provided for the schools and that is why the ICT is deficient in the schools (Adeyemi, 2010).

Some of the researchers have suggested that the students who use computers or taught with its help can perform better than those taught through the conventional or traditional method (Sing, 1991; Joshi and Mahaptra, 1995). Teachers and the students felt that introducing computer education in schools was a positive step, as it will help the students in improving their logic as positive effect was seen in the students (Pradhan and Khirwadkar, 1999). The researchers tried to find out the effectiveness in teaching and learning process by using computers. Mahajan, (1994) found out that the Computer Assisted Instructions were more effective than traditional methods. Enigo (1997) found that the instructor controlled interactive video was more effective than lecture method. The students who were exposed to video method performed better than students taught by the traditional lecture method (Idayavani, 1991). Researchers therefore have tried to find out availability of ICT tools like radio and T.V sets in schools which influence the teaching and learning process. As the study conducted by (SCERT, Orissa.1982) revealed that only 62% of high schools had radio sets, and 25% of high schools expressed inability to purchase radio sets due to non-receipts of circulars and non-availability of funds/ lack of funds and the study conducted by (Parhar, 1994) found that out of twenty schools only four were using school TV programs fully.

A careful and thorough review of published literature on the subject revealed that the ICT has been studied by a large number of researchers at the international and national level. Some of researches have been conducted to examine the impact or the effect of ICT, some have been conducted on the usage of the ICT conventional tools like T.V. and radio and some on the modern ICT tools such as computer, smart-board, etc. But in the view of the fact, the research work based on the Status of ICT in schools has not yet been conducted either by the national or by the international researchers. Moreover, the Usage of ICT in schools has not been selected for the research studies in developing country including India. Review of literature at national level showed thumbs down research articles dealing with the Usage of ICT in Higher Secondary Schools and none of the studies either directly or indirectly studied the Status of ICT in the Higher Secondary Schools of any state. Since the usage of ICT by the school are supposed to influence the teaching and learning process and there is a dearth of published literature in the area of secondary education in the country, the investigator was inspired to conduct a study on the ICT, its Status and Usage in Higher Secondary Schools. The empirical research venture which has been taken up by the present investigator on Higher Secondary Schools of Jammu and Kashmir may thus be considered as a novel, demanding and challenging as Jammu and Kashmir is most disturbing and disputed state in India, because of the insurgency and armed conflict which has been mugged from recent two decades. This constant shadow of conflict has affected almost all the sections of society.

## REFERENCES

Adenyemi, T. O., & Olaleye, F. O. (2010). Information and Communication Technology ICT for effective management of secondary schools for sustainable development in Ekiti state, Nigeria. *American Eurasian Journal of Scientific research* 5(2), 106-113. IDOSI Publications.

Agyemang, B. K. & Dadzie, P. (2010). Providing Information Communication Technology support to distance education students, in university of Ghana, Legon. *Turkish Journal of distance Education TOJDE,11*(3). *ISSN 1302-6488*

Albirini, A. (2004). *An exploration of the factors associated with the attitudes of high school EFL teachers in Syria toward Information and Communication Technology.* Unpublished doctoral dissertation, Ohio State University.

Annaraja, P. & Joseph, N. M. (2006). Teachers trainees' attitude towards Information and technology , *DESIDOC Bulletin of Information Technology, 26*(2), 37-40.

Antonysamy, L. S. (1989). A study on, teaching environmental concepts to school dropout through video and charts. M.Phil, Edu, Madurai Kamaraj University. In Buch, M. B. (1997). *Fifth survey of research on education. Trend reports, (1988-1992) Vol.* I p. 420 NCERT New Delhi.

Ayman, U. & Cenk, S. M. (2004). Implications of the integration of computing methodologies into conventional marketing research upon quality of students understanding of the concept. *The Turkish Online Journal of Educational Technology-TOJET, 3*(4). ISSN: 1303-6521.

Aypay, A. (2010). Information and Communication Technology ICT usage and achievements of Turkish students in PISA 2006. *The Turkish Journal of Educational Technology, 9*(2).

Babila, M.T. (2010). The impact of ICT on students study habits, Case study: University of Buea, *Cameroon. Journal of Science and Technology Education Research, 1*(5), 107–110. Retrieved from http://www.academicjournals.org /JSTER.

Bashir, F. & Siddiqui, M. H. (2012). Usage of ICT by the students in higher secondary schools of Jammu and Kashmir. *International Organization of Scientific Research. (IOSR) Journal of Humanities and Social Science. (JHSS) 4*(2), 37-41. www.Iosrjournals.Org.

Bashir, F.(2013). Usage of ICT by female students in higher secondary schools of district Anantnag, Jammu and Kashmir. *An international journal of education and humanities, Vol. 2 (1),p.133-138.*APH Publishing Corporation. New Delhi.

Bhangoo, S. & Sidhu, R. (1997). Impact of selected audio-visual aids on food and hygiene knowledge of secondary school students. *Trends' in Education, vol. XXXII. (1). 89,96 in 2006 Sixth survey of Educational Research (1993-2000) Vol. I* p. 157. NCERT, New Delhi.

Box, K. (1999). A Snapshot of Texas High School. Denton, TX: Texas Center for Educational Technology. Retrieved from http://www.tcet.unt.edu/research/ techrept/snapl.htm.

Canvas, B., Canvas, P., Karaoglan, B., & Kisla, T. (2009). A study on science teachers' attitude toward Information and Communication Technologies IN education. *The Turkish online Journal Of Education and Technology- TOJET, 8*(2).

Chakravarty, T. R. et.al. (1982). Satellite instructional television experiment-a study of Chhattisgarh, NIRD. In Buch, M. B. (1991). *Fourth Survey of Research in Education (1983-1988) Vol. I,* P. 777. NCERT New Delhi.

Cifuentes, E. & Shih, T. (1999). Reparation for on-line teaching, paper present at the *ACET conferences, Huston, T X. Turkish Online Journal of Distance Education-TOJDE October 2002 ISSN 1302-6488. Vol. 3 No.4.* Retrieved from *http://www.tojde.anadolu.edu.trtojde8/article/ equity. induction. htm.*

Cox, M., Preston, C., & Cox, K. (1999, September). *What factors support or prevent induction from Himsing ICT in their classrooms?* Paper presented at the British Educational Research Association Annual Conference, University of Sussex, Brighton.

Demetriadis, S. et al., (2003). Cultures in negotiation: Teachers' acceptance/ resistance attitudes considering the infusion of technology into schools. *Computers and Education, 41*(1), 19-37. Retrieved from http://proquest.umi. com/pqdlink?did= 73688561 & Fmt= 7&clientld.

Dey, B. et al., (2005). information communication technology and teacher educators: An empirical study. *The Journal of Education, 1*(2). New Delhi: Gyan Publication.

Donnelly, D., McGarr O., & Reilly, J. O. (2011). A framework for teachers' integration of ICT into classroom practice. Dept of Education and Professional studies, University of Limerick, Limerick, Ireland. *An International Journal on Computers and Education, 57*(2). Retrieved from www.elsevier.com/locate/compedu.

Enigo, M. C. (1997). Effectiveness of instructor controlled interactive video as compared to Conventional non-interactive video and lecture method in

modifying the cognitive behavior among farmers in agriculture, *in 2006 Sixth Survey of Educational Research (1993-2000). Vol. I.* p-156. NCERT, New Delhi.

Erkan, A. (2003). *Teachers' attitudes toward computer technology use in vocabulary instruction.* Unpublished doctoral dissertation, Bilkent University, Ankara.

Fink, A. (1998). *Conducting research literature reviewers.* From paper to internet, thousands oak, CA: sage.

Giri, A. P. (1990). A study of problems and prospects of school radio broadcast programs PhD, Edu. Utkal Unversity. In Buch, M.B (1997). *Fifth survey of research on education (1988-1992) Vol. I* pp. 420-421. NCERT, New Delhi.

Goel, D. R. (1985). A study on Educational Television in India, organization and utilization, CASE, MSU, (UGC financed). In Buch, M.B. (1991). *Fourth survey of research on education (1983-1988) Vol. I* p.p 782-783 NCERT New Delhi.

Gray, D. S. & Souter, N. (2002). *Secondary science teachers use of , and attitudes towards , ICT in Scotland.* A Report Faculty of Education, University of Starthclyde. 76 South Brae Drive, Glasgow G13 1PP, Scotland, UK, Available at: http://www.iubs.org/cbe/paper/souter-second .Html .

Guri-Rosenblit, S. (2005). *Distance Education and e-learning: Not same thing Higher Education Vol. 49,* No.4, pp 467-493. Springer Stable URL:http//www.jostor.org/stable/25068081.

Hakverdi-Can, M. & Dana, T. M. (2012). Exemplary science teachers' use of technology. *The Turkish Online Journal of Educational Technology , 11*(1).

Hardiman, G. J. (1988). Attitude of secondary school principals towards Microcomputers , *Dissertation Abstract International, 50*(2), 315-A.

Hashim. R., Ahmad. H. & Abdullah C. Z. (2010). Assessing the attitude of distance learners towards the use of ICT in education. *Turkish Journal of Distance Education- TOJDE, 11*(2). ISSN 1302-6488.

Hiltz, S. R. (1997). Impacts of college level courses via asynchronous learning networks: Some preliminary results. *Journal of Asynchronous learning Network*, (2), 1-9. Retrieved from *http://www.tcet.unt.edu/research/techrept/snapl,htm*

Idayavani, S. (1991). Developing a video program on weathering and work of rivers in physical geography for higher secondary students .M. Phil, Edu. Madurai University Kamaraj, university. In Buch, M. B. (1997) *Fifth survey of research on education Trend Reports, (1988-1992) Vol.1* p.421. NCERT, New Delhi.

Jeyamani, P. (1991). Effectiveness of Simulation Model of teaching through (CAI). M. Phil, Edu. Avinashilingam Institute for Home Science and Higher Education for women, Coimbatore in *Buch, M.B (1997) fifth survey of research on education, Trend Reports, (1988-1992) Vol. I p. 426. NCERT, New Delhi*

Joshi, A. & Mahapatra, B. C. (1995). Effectiveness of computer software in terms of higher mental ability in science. *Indian Journal of psychometry and Education, 26(2), 105-108 in (2006) sixth survey of Educational Research (1993-2000) Vol. I.* P-159 NCERT New Delhi.

Kapadia, A. M. (1992). The impact of television on students learning. An exploration PhD, Edu. South of Gujarat University. In Buch, M. B. (1997). *fifth survey of research on education Trend Reports, (1988-1992) Vol. I* p. 421. NCERT, New Delhi.

Karadag, Z. (2003). Application of computer aided mathematics teaching in a secondary school. *The Turkish Online Journal of Educational Technology – TOJET, 2*(1). ISSN: 1303-6521.

Khan, N. (2007). *Attitude of university teachers towards Information and Communication Technology ICT and the inhibiting in its use in higher education.* Unpublished Dissertation, submitted in partial fulfillment of requirements for the award of the degree of Master of Education, Aligarh Muslim University, Aligarh, India, Department of Education.

Kiridis. A., Dorros, V., & Tsakiridou, E. (2006). Teachers facing information and communication technology (ICT): The case of Greece, *Journal of Technology and Teacher education 14*(1), 75-96.

Kothari, S., & Chowdhari, M. (1995). The impact of television programmes on behavior of students of different age levels. *Psychology, Vol. 25 (1&2), 43-50 in 2006 in the Sixth survey of Educational Research (1993-2000) Vol. 1* p. 156. NCERT, New Delhi.

Magnusson, L., Hason,E., & Nolan, M. (2005). *The impact of Information and Technology on family careers of older people and professionals in Sweden.* Cambridge Journal University: Aging and society25.

Mahajan, L. (1994). Effectiveness of computer instruction for teaching singular and plural at II grade. *Bhratiya Shiksha Shodh Patrika 13*(1), 29-32. *In (2006) in the Sixth survey of Educational Research (1993-2000) Vol. 1* p. 159. NCERT, New Delhi.

Matthiasdottir, A., Dal, M. & Lefevr, S.C. (2003, June). How do teachers use Information and Communication Technology in Icelandic high schools in 2002? *Proceedings of the 4th International conference on computer system and*

*technologies e-learning, Rousse, Bulgaria*. 562-567. Retrieved from http://ecet.ecs.ru.bg/est/docs/proceedings/S4/IV-4.pdf.

McCarthy, P. J. (1998). *Teacher attitude toward computers and the relationship between attitudes toward computers and the level of involvement with computers among New York City special education teachers.* Unpublished doctoral dissertation), Columbia University Teachers College , New York, DAI59/01A, p. 133.

Mishra, S., & Panda, S. (2007). Development and factor analysis of an instrument to measure faculty attitude towards e-Learning. *Asian Journal of Distance Education, 5* (1), 27-33.

Mishra, S., & Panda, S. (2007). E-learning in A Mega Open University: Faculty attitude, barriers and motivators. *Educational Media International, 44* (4), 323-338.

Mohanty, J., Giri, A. P., &Mohanty, P. C. (1976). A study on educational television programmes telecast during the In-service Teachers Training course,1975, Directorate of Higher Education. Orissa *in Buch, M.B. (1991) fourth survey of research on education (1983-1988) Vol. 1* p. 790 NCERT New Delhi.

Moseley, D., & Higgins, S. (1999). Ways forward with ICT: Effective pedagogy using Information and Communication Technology for literacy and numeracy IN primary schools. University of Newcastle. London: Teacher Training Agency.

Nagaraju, C.S., & Usha, R. (1983). School broadcasting: Utilization by high schools in Bangalore District, ISEC Bangalore. In Buch, M.B (1991) *Fourth Survey of Research in Education (1983-1988) Vol. 1* p. 792. NCERT, New Delhi.

Nelson, O. (2010). *ICT and the educational performance: The inter-relationship of selected critical variables in Convenant University College of Human Development Covenant University.* Ogun State, Nigeria. Jan 10, article 03. Retrieved from http://www.itdl.org/journal/May_10/article03.htm

Nikolaus, K. A. (1985). A study of the attitude of Tennessee teachers toward computers in the classroom, Tennessee State University, *Dissertation Abstract International, 48*(11) - 2799.

Ogunkola, B. J. (2008). Computer attitude, ownership and use as predictors of computer literacy of science teachers in Nigeria. *International journal of Environment & Science Education, 3*(2), 53-57.

Ololube, N. P., Ubogu, A. E., & Egbezor, E. D. (2007). ICT and distance education programmers in sub-Saharan African country A theoretical perspective . *Journal of Information technology Impact* 7(3), 181-197.

Ozgen, K., & Bindak, R. (2012). Examining student opinions on computer use based on the learning styles in mathematics education. *The Turkish Online Journal of Educational Technology, 11* (1).

Parhar, M. (1994). A study of Effect of media on students learning. PhD, Edu. Jamia Millia Islamia. Guide: prof Girija Mohd. Miyan *in 2006 sixth survey of Educational Research (1993-2000) Vol. I* p. 156. NCERT, New Delhi.

Petros, R. (2007). The Greek Computer attitude scale: construction and assessment of psychometric properties. *Computers in Human Behavior, 23* (1), 578-590.

Pitts, A., & Kwami, R. M. (2002). Raising students performance in music composition through the use of information and communication technology

(ICT) a survey of secondary school in England. *B. J. music Ed. 19*(1), 61-71,Cambridge University Press.

Porta, M., Mas-Machuca, M., Martinez-Costa.C., & Maillet, K. (2012). A Delphi study on Technology Enhanced Learning (TEL) applied on Computer Science (CS) skills. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 8*(1), 46-70.

Pradhan, N., & Khirwadkar, A. R. (1999). Computer education in secondary schools of Baroda City. *Journal of Educational Technology, 2*(2), Jan, New Delhi.

Rajashekar, S., & Vaiyapuri, R. P. (2007). Higher secondary teacher's computer knowledge and their attitude towards computer. *Journal of All India Association of Educational Research, 19* (1 & 2), 8-69.

Ransgaraj (1997). Studied the effectiveness of computer assisted instruction in teaching physics at higher Secondary stage PhD., Edu, Bharathiar Univ Guide. Dr. N. Balasubramain in (2006) *in Sixth survey of Educational Research (1993-2000) Vol. I* p. 159. NCERT, New Delhi.

Rao, L. N. (1984). A study of factors influencing the effective use of audio-visual equipments and materials in classroom teaching. PhD, Edu, SVU in *Buch, M.B (1991) fourth survey of research on education (1983-1988) Vol. I* P. P. 794-795 NCERT, New Delhi.

Richardson. (2002). *An ecology of learning and role of E-learning in the learning environment: A discussion paper in connecting the future.* Global Summit of the online knowledge Network, Education, unlimited, Dulwish, as reported http://www.educationau.edu.au/globa/summit/papers/aircharhdsonpd.h.

Rosen, L. D., & Weil, M. M. (1995). Computer availability, computer experience and technophobia among public school teachers. *Computer in Human Behavior, 11* (11), 9-31.

Sadik, A. (2006). Factors influencing teachers' attitude towards personal use and school use of computers: New evidence from a developing nation. *Evaluation Review, 30*(1), 86-113.

Sahni, R. (1999). Gender difference in achievement in computer science. *Journal of Education Technology, 2*(3).

Samah, A. (2010). Computer use by secondary Principals University of Putra Malaysia. *Turkish journal of Educational Technology, 9(3).*

Samak, Z. A. (2006). *An exploration of Jordanian English language teachers' attitudes, skills, and access as indicators of Information and Communication Technology integration in Jordan.* Unpublished Doctoral Dissertation, Florida state university, Florida.

SCERT, ORISSA. (1982). An on the Spot Evaluative study on school Broadcast Programme in the towns of Cuttack and Bhubaneswar in Orissa, in *Buch, M.B (1991) Fourth Survey of Research in Education (1983-1988) Vol. 1* p.798. NCERT New Delhi.

Selwyn, N., Gorard, S., Furlong, J., & Madden, L. (2003). *Older adult's use of Information and Communication Technology in everyday life.* United kingdom: Cambridge University Press.

Seth, I. (1983). A study of the effectiveness of educational television on the educational development of primary school children, PhD Edu., MSU. In Buch,

M. B. (1991) *Fourth survey of research on education (1983-1988) Vol.I,* p.798 NCERT New Delhi.

Sharma, B. (2002). Attitude of secondary school students towards Information Technology. Unpublished Dissertation, submitted in partial fulfillment of requirements for the award of the degree of Master of Education, Aligarh Muslim University, Aligarh, India, Department of Education.

Sharma, M. (2006). *A study of the graduate students' attitude towards Multimedia Information Technology in relation to their gender, religion, parental education and occupation.* Unpublished Dissertation, submitted in partial fulfillment of requirements for the award of the degree of Master of Education, Aligarh Muslim University, Aligarh, India, Department of Education.

Siddiqui, U. (2002). *Attitude of secondary school students towards Information Technology.* Unpublished Dissertation, submitted in partial fulfillment of requirements for the award of the degree of Master of Education, Aligarh Muslim University, Aligarh, India, Department of Education.

Singh, R. D., Ahluwalia, S. B., & Verma, S. K. (1991). Teaching of mathematics: Effectiveness of Computer Assisted Instruction (CAI) and conventional method of instruction. Indian Educational Review, VOL 26 (4), 15-34. In Buch, M.B (1997) *fifth survey of research on education (Trend Reports, (1988-1992) Vol. I* p. 426. NCERT, New Delhi.

Stiles, M. J. (2000). *Effective learning and virtual learning environment.* The learning development center Stafford shrine University, UK, [The case project]. Retrieved from http://www.staffs,ac,UK/cose.

Sudame, G. R. & Goel, D. R. (1988). A study of school broadcasts in Baroda District. New Delhi, National Council of Education and Training. In Buch, M. B. (1997)

*Fifth survey of research on education (1988-1992) Vol.I* p.426 NCERT, New Delhi.

Sultana, S. (2001). *The attitude of IX class students towards computer and their achievement in science.* Unpublished Dissertation, submitted in partial fulfillment of requirements for the award of the degree of Master of Education, Aligarh Muslim University, Aligarh, India, Department of Education.

Tasir, Z., Mohammed El Amin A. K., Abd Halim, N. D., & Harun, J. (2012). Relation between teachers' ICT competency, confidence level and satisfaction towards ICT Training Programmes: A Case study among postgraduate students. Department of Educational Multimedia Faculty of Education Universiti Teknologi Malaysia. *The Turkish Online Journal of Educational Technology ,11*(1).

Tsitouridou, M., & Vryzas, K. (2003). Early childhood teachers' Attitude towards Computer and Information Technology: The Case of Greece. *Information Technology in Childhood Education Annual,* (1), 187-207.

Usun, S. (2004). Undergraduate Students Attitude on the use of Computers in Education. *The Turkish Online Journal of Educational Technology – TOJET, 3*(2). ISSN: 1303-6521.

Utulu, S. C. (2012). Use of mobile phones for project based learning by undergraduate students of Nigerian private universities. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 8*(1), 4-15.

Vandana,S & Tanvi, A (2007). Students attitude towards the use of Information Technology in education. Retrieved from *www.rim/engg.com/cott2008,proceedings/M803* on 22 April, 2008.

Vekiri, I. (2010). Socioeconomic difference in elementary students ICT beliefs and out of school experiences. *Computers and Education, 54* (4), 941-950.

Wiken, G., & Molster, T. (2011). Norwegian secondary school teachers and ICT in Harmer Norway. *European Journal of Teacher Education, 34*(2), 209-218. Retrieved from http://www.informaworld.com.

Wozney, L., Venkatesh, V., & Abrami, P. (2006). Implementing Computer Technologies: Teachers' perceptions and practices. *Journal of Technology and Teacher Education, 14*(1), 173-207.

Yunus, M. M. (2007). Malaysian ESL teachers' use of ICT in their classrooms: Expectations and relatives European association for computer assisted language learning. *Recal.19* (1),79-95.

# Chapter-3

# Research Methodology and Procedures

# CHAPTER-3

## RESEARCH METHODOLOGY AND PROCEDURE

# CHAPTER 3

# RESEARCH METHODOLOGY AND PROCEDURES

Research in any discipline is a ceaseless effort, so in the quest of carrying out the study every researcher has to take utmost care in carrying out research work. Research fills the void of knowledge and consequently provides some new knowledge. In all researches, the objective of the investigation is contingent upon the accuracy of research methodology. The choice of methodology of research is determined by the nature of problem because every specific research demands and requires a particular process and operation to be undertaken for carrying out the investigation.

In carrying out any research, it is necessary to carefully adopt appropriate research methodology, selecting tools, choosing appropriate sample through appropriate sampling technique, and undertaking sound procedure for collecting data, tabulating them and then analyzing the data by applying most suitable statistical technique for the purpose of drawing meaningful conclusions.

This chapter provides a portrayal of the quantitative design used in the present study, ICT: its Status and Usage in Higher Secondary Schools (HSS) of Jammu and Kashmir. In this regard the methodology has been presented in the following sections.

## 3.1 RESEARCH METHODOLOGY

Research methodology enables a researcher to anticipate what the appropriate research decisions should be so as to maximize the validity of results. It is critical that the choice of research design be appropriate to the subject under investigation (Patton, 1987). In the case of quantitative research, the goal is to gather data that prove or disprove the knowledge claim (Borg & Gall, 1989).

Quantitative research in education can be categorized into two types, viz. descriptive studies and studies intended to discover causal relationships. Descriptive studies deals with finding out "what is" and the causal comparative method "is aimed at the discovery of possible causes for the phenomena being studied by comparing subjects in whom a characteristic is present with similar subjects in whom it is absent or present to a lesser degree" (Borg & Gall, 1989).In the present study quantitative research methods were utilized to test the proposed hypotheses. Descriptive research is referred to as survey research (Gay & Airasian, 2000), which is mainly concerned with "attitudes, opinions, preferences, demographics, practices and procedures". According to Gay & Airasian, "descriptive data are usually collected by questionnaire, interview method, telephone talks, or self observation".

Descriptive survey method of research was employed for the present study, as this method is concerned with investigating, reciting, surveying and exploring the existing phenomena or issues, conditions and relationships that exist. The present study tried to find out the Status and Usage of ICT in HSS of Jammu and Kashmir.

## 3.2 RESEARCH POPULATION AND SAMPLE

A population may include all the individuals of a particular type or a more restricted part of that group. A "population" is any group of individual / unit that have more characteristics in common which are of interest to the researcher, for a particular research (Best and Kahn 1993). Higher Secondary Schools from District Anantnag of Jammu and Kashmir constituted the target population of this study as described in the table no. 3.1.

**Table 3.1**

**Target Population of the Study**

| *Total Higher Secondary Schools* | *Total number of Students* | *Total number of Teacher* |
|---|---|---|
| **53** | **13250** | **9240** |

The term sampling refers to the strategies which enable us to pick a subgroup from a larger group and then use the subgroup as a basis for making judgment about the larger group. In order to make use of such a subgroup to put up decisions about the larger groups, the subgroup has to resemble the larger group as closely as possible.

A "sample" is a small portion of a population selected for the study. By observing the characteristics of the sample; one can make certain interference about the characteristics of the population from which it is drawn. According to Wiersma (2000), sample is "a subset of the population to which the researcher intends to generalize the result".

In the present study stratified random sampling technique, was employed, with a purpose to select a sample of Higher Secondary Schools of District Anantnag of Jammu and Kashmir state. The sample consists three categories, first based on school for measuring status of ICT, second and third categories based on students and teachers for measuring the level of ICT usage.

The sample of first category comprised N=53 Higher Secondary Schools (HSS), all the HSS of target Population were taken into consideration, shown in figure 3.1.

The sample of second category encompassed N=265 students from HSS, who were selected by using stratified random sampling with the percentage of (2) out of the target population (13250), shown in figure 3.2.

The sample of third category consisted of N=462 teachers from HSS, who were selected by using stratified random sampling with the percentage of (5) out of the target population (9240), shown in figure 3.3.

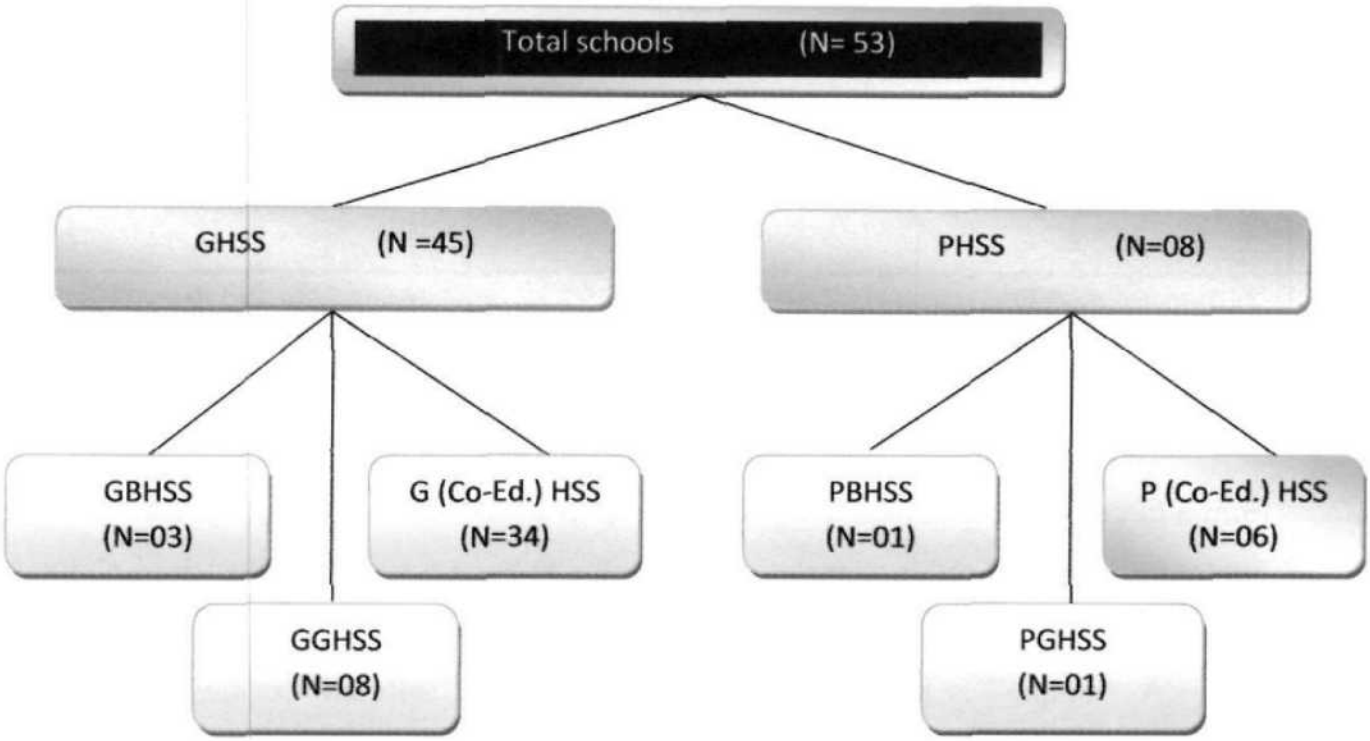


Figure 3.1 Represents Sample break-up of Schools

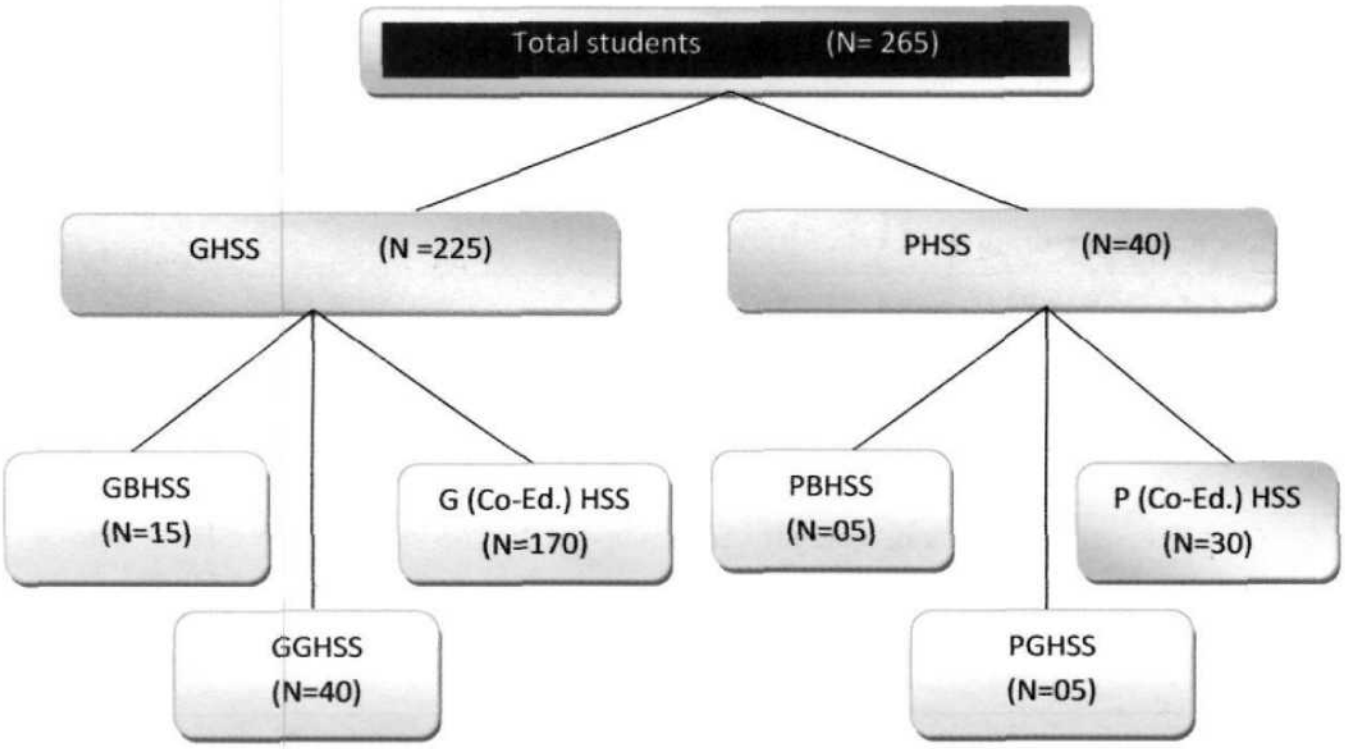


Figure 3.2 Represents Sample break-up of Students

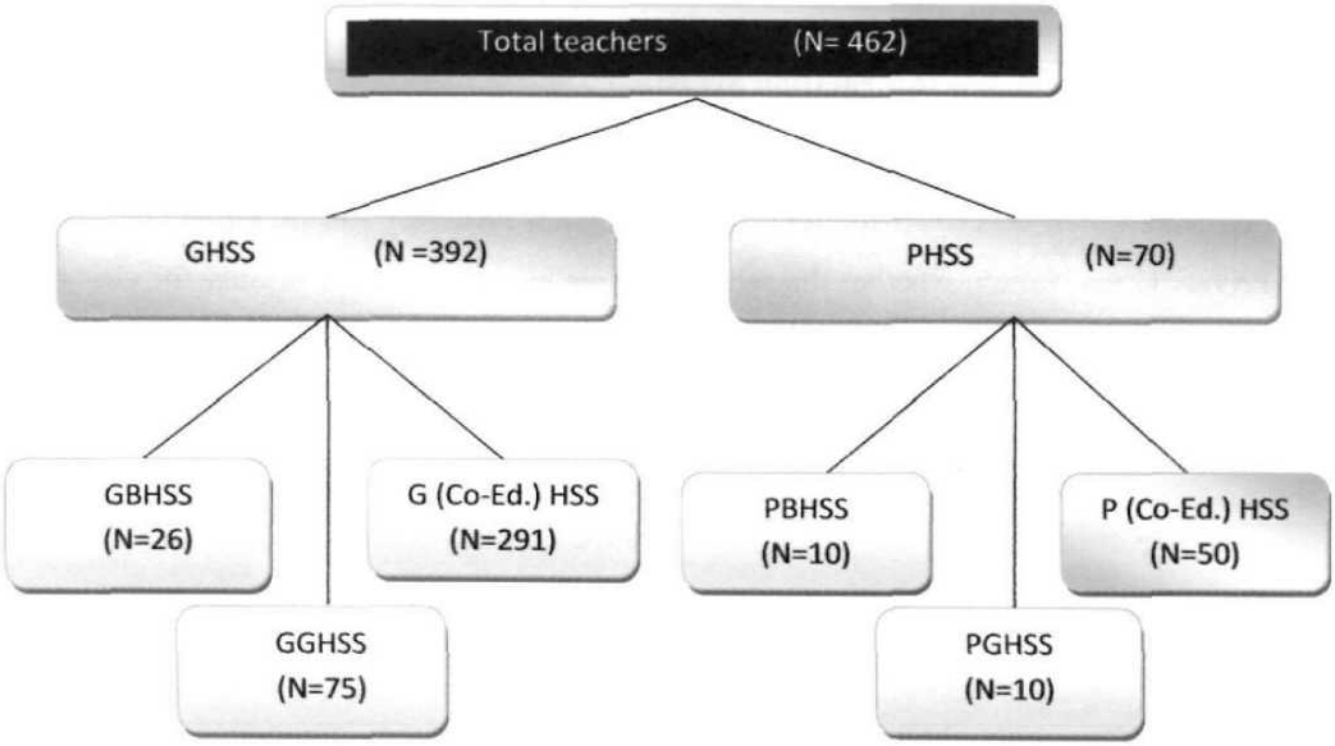


Figure 3.3 Represents Sample break-up of Teachers

## 3.3 RESEARCH TOOLS

To carry any type of investigation, data is gathered from which the hypothesis may be tested. The meaningfulness of results of any research work depends not only on the method and procedure, data analysis or result interpretation but also on the appropriateness of the tools and measures employed in the study. They should be appropriate and well suitable for the kind of sample involved in research work.

To know the status and the level of usage of ICT in the HSS the appropriate tool was not available, which may tell about the status and usage of ICT hence, the information schedule and questionnaire were prepared to fulfill this need. However, questionnaire since long has been the most favored and convenient tool in educational researches.

### 3.3.1 Description of Tool

**(A) Self Constructed Information Schedule**

A self constructed information schedule for Higher Secondary Schools was prepared which described the name of the schools, whether run by Government or Private Organization, whether the school was meant only for boys or only for girls or it was co-educational. Moreover, it provided the information regarding the status of ICT in Higher Secondary Schools of (District Anantnag) Jammu and Kashmir. (see Appendix A).

In order to study the Status of ICT in the HSS an information schedule which contained 25 items based on response 'YES' or 'NO' (the frequency system) was prepared where (Yes=1) and (No=0).

**(B) Self Constructed Questionnaire for Students**

A self constructed questionnaire for students of HSS was prepared, describing the name of student, who studied in government or private Schools, whether they were getting education in the higher secondary schools meant only for boys or only for girls or co-educational. Moreover, it provided the information regarding the level of ICT usage by higher secondary school students of Jammu and Kashmir. (see Appendix B).

The self constructed questionnaire contained 25 items based on Likert method. The questionnaire employed three choices expressing different degree of responses for Usage as (Fully Used =3, Partially Used= 2, Not Used= 1). It was designed to elicit information from respondents about their level of ICT usage.

**(C) Self Constructed Questionnaire for Teachers**

A self constructed questionnaire for teachers of HSS was prepared, describing the name of the teacher, whether employed in government or private school, whether they imparted education in higher secondary schools which were meant only for boys or only for girls or co-educational. Moreover, it provided the information regarding the level of ICT usage by higher secondary school teachers of Jammu and Kashmir. (see Appendix C).

The self constructed questionnaire contains 25 items based on Likert method. This questionnaire employed the three choices expressing different degree of responses for Usage as (Fully Used =3, Partially Used= 2, Not Used= 1). It was designed to elicit information from respondents about their level of ICT usage.

### 3.3.2 Validity of the Tools

Validity refers to "the extent to which an instrument measures what it is designed to measure" (Brown, 1996). Validity is also considered as the strength of conclusions, inference or proposition. To ensure validity of tools the two methods were used- the face validity and construct validity.

(i) **Face Validity:** Face validity refers to "the degree to which a test appears to measure what it claims to measure" (Gay & Airasian 2000).Face validity of the instrument was fairly high as established by consulting subjects in the study. The face validity for the schedule was established by the panel of experts. Initially 50 ICT items were selected which were used in the schools and then the healthy suggestions from the 10 experts of three universities namely, University of Kashmir (J&K), Aligarh Muslim University (Aligarh) and Jamia Millia Islamia University (New Delhi) were taken for making the evaluations easy and accurate. The 80% of the agreement from the experts were taken as standard value for each item. Subsequently the feedback from connoisseurs was used and only 25 items were established and 25 items were eliminated in the tool of students and the same procedure was followed in the tool of teachers. The experts communicated their critical comments and suggestions required for the construction of the tool. As a result, some ICT items which were not of use in educational system were eliminated and some new items were incorporated so as to make the tool more suitable and effective.

(ii) **Construct Validity:** Construct validity, an overarching term now seen by most to encompass all forms of validity, which refers to the extent to which a measure adequately assesses the construct it purports to assess (Nunnally & Bernstein, 1994).

For examining the construct validity of the tool for the students, pilot study was made on 53 students and after that the data was analysed with the help of SPSS. The construct validity of the questionnaire was found by checking the relation between the degree of item and total degree of the questionnaire by using Pearson correlation coefficient and all the correlations were considered at (0.01) level or (0.05) level of significance which has been tabulated in (table 3.2).

**Table 3.2 Construct Validity of the Students**

| S.no. | Name of the item | Sum(total degree for tool) | |
|---|---|---|---|
| | | *Pearson Correlation* | *Sig (2-tailed)* |
| 1 | Computer | .748** | .000 |
| 2 | Internet | .917** | .000 |
| 3 | Projector | .780** | .000 |
| 4 | LCD-Projector | .597** | .000 |
| 5 | Slide- Projector | .349* | .028 |
| 6 | Film | .467** | .000 |
| 7 | Film-Projector | .308* | .028 |
| 8 | Epidiascope | .548** | .000 |
| 9 | Tape-recorder | .619** | .000 |
| 10 | Audio-Cassette | .619** | .000 |
| 11 | Video –Cassette | .917** | .000 |
| 12 | On-Line teaching/learning | .597** | .000 |
| 13 | Blackboard | .349* | .022 |
| 14 | Smart-board | .308* | .023 |
| 15 | Whiteboard | .619** | .000 |
| 16 | CD-Player | .917** | .000 |
| 17 | DVD-Player | .917** | .000. |
| 18 | CD /DVD | .917** | .000 |
| 19 | Audio-Conference | .349* | .034 |
| 20 | Video-Conference | .548** | .000 |
| 21 | Loud-Speaker | .308* | .028 |
| 22 | T.V. | .917** | .000 |
| 23 | Radio | .917** | .000 |
| 24 | Chart | .780** | .000 |
| 25 | Calculator | .619** | .000 |

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

For investigating the construct validity of the tool for teachers, pilot study was made on 53 teachers and after that the data was analysed with the help of SPSS. The construct validity of the questionnaire was found by checking the relation between the degree of item and total degree of the questionnaire by using Pearson correlation coefficient and all the correlations were considered at (0.01) level or (0.05) level of significance which has been tabulated in the (table 3.3).

**Table 3.3 Construct Validity of the Teachers**

| S.no. | Name of the item | Sum(total degree for tool) | |
|---|---|---|---|
| | | *Pearson Correlation* | *Sig (2-tailed)* |
| 1 | Computer | .692** | .000 |
| 2 | Internet | .920** | .000 |
| 3 | Projector | .474** | .000 |
| 4 | LCD-Projector | .435** | .000 |
| 5 | Slide- Projector | .630* | .028 |
| 6 | Film | .626** | .000 |
| 7 | Film-Projector | .436* | .028 |
| 8 | Epidiascope | .860** | .000 |
| 9 | Tape-recorder | .576** | .000 |
| 10 | Audio-Cassette | .337* | .018 |
| 11 | Video –Cassette | .872** | .000 |
| 12 | On-Line teaching/learning | .880** | .000 |
| 13 | Blackboard | .290* | .022 |
| 14 | Smart-board | 480** | .000 |
| 15 | Whiteboard | .700** | .000 |
| 16 | CD-Player | .750** | .000 |
| 17 | DVD-Player | .920** | .000 |
| 18 | CD /DVD | .960** | .000 |
| 19 | Audio-Conference | .630** | .000 |
| 20 | Video-Conference | .870** | .000 |
| 21 | Loud-Speaker | .690** | .000 |
| 22 | T.V. | .860** | .000 |
| 23 | Radio | .691** | .000 |
| 24 | Chart | .870** | .000 |
| 25 | Calculator | .790** | .000 |

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

### 3.3.4 Reliability

A measurement of instrument is considered to have a high degree of reliability when it is consistent and accurate (Mueller, 1986). Reliability is the degree to which a test consistently measures whatever it is measuring and the reliability coefficient indicates the consistency of the score produced (Gay and Airasain, 2000). It relates to the extent to which an instrument provides similar results every time it is administered to the same sample. Reliability was established using tryout.

The reliability of the instrument used in this study was assessed by using Cronbach's Alpha coefficient internal consistency for the students as well as for teachers. It was considerably high with value of (0.747) and (0.911) respectively. (See Appendix D & E).

**Table 3.4**

| **Reliability for the Questionnaire of the Students** | |
|---|---|
| Cronbach's Aplha | Number of Items |
| .747 | 25 |

Reliability of the questionnaire was calculated by using Cronbach's Alpha method of reliability for students which was calculated high as above table shows and this means that the tool was reliable.

**Table 3.5**

| **Reliability for the Questionnaire of the Teachers** | |
|---|---|
| Cronbach's Aplha | Number of Items |
| .911 | 25 |

Reliability of the questionnaire was calculated by using Cronbach's Alpha method of reliability for teachers which was calculated high as table above depicted and this means that the tool was reliable.

## 3.4 ADMINISTRATION OF TOOLS

After following all the steps for construction of the tool, the two questionnaires were completely prepared and subsequently they were administered to the sample after the approval of the Head of Institutions and management authorities. The subjects (teachers and students) were introduced with the main objectives of the study and were requested to ask the researcher if they faced any difficulty while filling the questionnaire. Also there was no time limit for filling up the questionnaire.

## 3.5 DATA ANALYSIS PROCEDURE

### Statistical Technique

Once the data was collected from respondents, it required applying certain kind of statistical treatment to reduce long wide-ranging scores into intelligible and interpreted form in order to understand the results very easily and conveniently. In order to make meaningful interpretation and draw conclusion, raw scores were recognized subjected to appropriate statistical analysis and summarized. This was achieved by Statistical Package of Social Science (SPSS 16.0 version).Moreover the bar-graphs were prepared by using MS Excel.

To fulfill the objectives of the present study, the data was analysed with the help of descriptive statistics (mean, SD), parametric tests like (t-test for one sample), (independent samples t- test), non-parametric tests (Kolmogorov- Smirnov test for one sample), (Mann-Whitney U test for independent samples). The description of the statistics techniques are as follows:

### (A) Percentage

"A part considered in its quantitative relation to the whole, expressed in hundredths. A share or a portion, as an allowance, commission, duty, interest, etc., that varies in proportion to some larger sum" (Webester's Student Dictionary 1996). In the present study the percentage has been used to check the Status of ICT and has been calculated with the help of SPSS.

**Mean**

"The mean is a hypothetical value that can be calculated for any data set; it doesn't have to be a value that is actually observed in the data set" (Field, 2006). Thus the mean value is hypothetical value which provides central value or typical representative of a set of scores as a whole. The mean is the average value of the distribution, or, the sum of all values divided by the number of values. (George & Mallery, 2007).

The representative numbers merely gave an idea of general ICT Status and Usage level (average value) of the group as a whole, (the sum of all values divided by the number of values). They did not show how individual scores were spread out. The mean has been calculated with the assistance of SPSS package.

**(B) Standard Deviation (SD)**

The Standard Deviation of a set of scores is the square root of the average of the squares of deviations of each score from the mean. "We often take square root of variance (which ensures that the measure of average error is in the same unit as the original measure).This measure is known as standard deviation" (Field, 2006).

Thus the SD is most stable and reliable measure of variability as it employs the mean for its computation. The SD advocated measuring the variability of the ICT Status and Usage of the group (Schools).SPSS software has been employed for calculating the SD of different groups.

**(C) t-test for one sample**

To test the null-hypothesis, t-test (for one sample) has been employed for evaluating the significance of difference between the means; it was only possible when mean and SD was known. "It is designed to test whether the mean distribution differs significantly from some present value" (George &Mallery, 2007).

The t-test for one sample has been used to know the difference between real mean for usage and expect mean for usage of ICT.

**(D) Independent Samples t-test**

To test the null-hypothesis, t-test (for two samples) has been employed for evaluating the significance of difference between the means. "The independent t-test is used in situations in which there are two experimental conditions and different participants have been used in each condition" (Field, 2006). "For independent sample t-test we are looking at differences between the groups and so we need to divide by the standard deviation of difference between the groups".

In the present study the independent t-test has been used to test the null-hypothesis (to evaluate the difference between the mean of sample and the assumed mean of population).

**(E) Kolmogorov-Smirnov Z test**

"As a test of goodness of fit, the KS test is concerned with the measurement of degree of agreement between the distribution of the scores or values in a given sample (observed scores) with some specified theoretical distribution (theoretical scores) based on the hypothesis of chance, equal probability and normal distribution" (Mangal 2010). The Kolmogorov-Smirnov test was employed as alternative for one sample t-test, where the sample was less than 25 (Sheskin, 2000).

**(F) Mann-Whitney U test**

The Mann-Whitney U test is considered to be more useful and powerful non-parametric test. It was very useful non parametric alternative to the t-test for assessing difference between two independent samples having uncorrelated data, especially in the circumstances when the assumptions and conditions for applying the t-test were not met. "The Mann-Whitney U test is designed to test the significance of the difference between two populations, using random samples drawn from the sample population. It is non-parametric equivalent of the parametric t-test", (Best & Kahn,

2006). This test can be used to the small samples size (N>25). But both the samples must be drawn from the same population. It can be used when the two sample sizes were not equal (Greene and D'Oliveira 2005).

In the current study the Mann-Whitney U test was employed as alternative for independent samples t-test, where the sample was less than 25.

## REFRENCES

Best, J. W., & Kahn, J. V. (1993). *Research in Education* (7th ed.). Needham Heights, MA: Allyn and Bacon.

Best, J. W., & Khan, J. V. (2006) *Research in Education* (9th ed.). Pearson Education, Inc and Dorling Kindersley. South Asia: Pearson Prentice Hall.

Borg, W. R., & Gall, M. D. (1989). *An Introduction* (5th ed.). New York: Longman, US.

Brown, J. D. (1996). *Testing in language program.* Upper Saddle River, NJ: Prentice-Hall Regents.

Field, A. (2006). *Discovering statistics using SPSS* (2nd ed.). Britain: London Sage Publication.

Gay, L. R., & Airasian, P. (2000). *Educational research: Competencies for analysis and application* (6th ed.). New Jersey: Prentice-Hall, Inc.

George, D., & Mallery, P. (2007). *SPSS for Windows Step by Step: A Simple Guide and Reference* (6th ed.). Pearson Education, Inc and Dorling Publishing, Inc.

Greene, J., & D'Oliveira, M. ( 2005). *Learning to use statistical tests in psychology* (3rd ed.). England: Open University Press McGraw- Hill.

Mangal, S. K. (2010). *Statistics in psychology and education* (2nd ed.). New Delhi: PHI Learning Private Limited.

Mueller, D. (1986). *Measuring social attitude: A handbook for research practitioners.* New York, NY: Teacher College Press.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.).New York: McGraw-Hill.

Patton, M. (1987). *How to use qualitative methods in evaluation.* Great Britain: London Sage Publications.

Sheskin, J. D. (2000). *Handbook of parametric and non parametric statistical procedures* (2nd ed.). New York, Washington, D.C: Chapman & Hall/CRC.

Wiersma, W. (2000). *Research methods in education: An introduction* (7th ed.). Boston: Allyn and Bacon.

Webester's Student Dictionary. (1996). *The New International Webesters English Dictionaty of the English Language.* International Encyclopedia Edition Sidney I. Landua. US: Trient Press International.

# Chapter-4

# Statistical Analysis of Data, Interpretation and Discussion

# CHAPTER-4

## STATISTICAL ANALYSIS OF DATA, INTERPRETATION AND DISCUSSION

### Section I

4.1: Objective No.1: To identify the Status of ICT in Higher Secondary Schools (HSS).

### Section II

4.2: Objective No.2: To find out the level of ICT Usage by the Students of Higher Secondary Schools.

### Section III

4.3: Objective No.3: To find out the level of ICT Usage by the Teachers of Higher Secondary Schools

## CHAPTER 4

# STATISTICAL ANALYSIS OF DATA, INTERPRETATION AND DISCUSSION

The present chapter is one of the most important chapters that deals with the outcome of the entire research endeavor. It is imperative to highlight that the whole research endeavor was aimed to study the Status and the Usage of ICT in the Higher Secondary Schools of Jammu and Kashmir. Hence, the entire data of the study were analyzed and reported through textual discussions. The textual discussions have been used to point out generalizations and significant interpretations. The tables and graphs were used to check the status of ICT in the Higher Secondary Schools of Jammu and Kashmir. The tables and bar-graphs were constructed for the identification of the Status of ICT in such a way that they are self explanatory. Then for checking the levels of ICT usage, the descriptive statistics were used followed by the inferential statistics. The sample descriptions with the interpretation and discussion of the analyzed data have been presented in the following three sections:

## Section I

Total school sample of 53 was taken to identify the Status of the ICT in Higher Secondary Schools (HSS) of District Anantnag (Jammu and Kashmir). The distribution of the sample is as under:

1. Government Higher Secondary Schools (GHSS).
    - Government Boys Higher Secondary Schools (GBHSS).
    - Government Girls Higher Secondary Schools (GGHSS).
    - Government Co-Educational Higher Secondary Schools (G (Co-Ed.) HSS).
2. Private Higher Secondary Schools (PHSS).
    - Private Boys Higher Secondary Schools (PBHSS).
    - Private Girls Higher Secondary Schools (PGHSS).
    - Private Co-Educational Higher Secondary Schools (P (Co-Ed.) HSS).

## Section II

Total sample of 265 students was taken to identify the level of ICT Usage in Higher Secondary Schools (HSS) of District Anantnag (Jammu and Kashmir). The distribution of the sample is as under:

1 Government Higher Secondary School (GHSS) Students.

- Government Boys Higher Secondary School (GBHSS) Students.
- Government Girls Higher Secondary School (GGHSS) Students.
- Government Co-Educational Higher Secondary School (G (Co-Ed.) HSS) Students.

2 Private Higher Secondary School (PHSS) Students.

- Private Boys Higher Secondary School (PBHSS) Students.
- Private Girls Higher Secondary School (PGHSS) Students.
- Private Co-Educational Higher Secondary School (P (Co-Ed.) HSS) Students.

## Section III

Total sample of teachers 462 was taken to identify the level of ICT Usage in Higher Secondary Schools (HSS) of District Anantnag (Jammu and Kashmir). The distribution of the sample is as under:

1. Government Higher Secondary School (GHSS) Teachers.

- Government Boys Higher Secondary School (GBHSS) Teachers.
- Government Girls Higher Secondary School (GGHSS) Teachers.
- Government Co-Educational Higher Secondary School (G (Co-Ed.) HSS) Teachers.

2. Private Higher Secondary School Teachers.

- Private Boys Higher Secondary School (PBHSS) Teachers.
- Private Girls Higher Secondary School (PGHSS) Teachers.

- Private Co-Educational Higher Secondary School (P (Co-Ed.) HSS) Teachers.

Following the above scheme, the entire data were analyzed; hence, the on-going description and discussion of results are presented in the same sequence. The purpose of data analysis was to reduce data into intelligible and interpretable form so that the relations of the research problems can be studied and conclusions drawn (De Vos, 1998). Before drawing the purposeful results and discussion, it is highly important to mention that the objectives were answerable by research questions and the prediction of hypotheses were based on the results. Moreover, for group comparisons on criterion variable null hypotheses were framed. Therefore, in case of significant difference, the null hypotheses were treated as rejected and in case of in significant difference, the null hypotheses were treated as accepted. Now, description and discussion of the results follow:

## Section I

### 4.1 Objective No.1: To identify the Status of ICT in Higher Secondary Schools (HSS).

In order to study the Status of ICT in Higher Secondary Schools, the objective is divided into sub-objectives which were framed to achieve the main objective.

### 4.1.1 To find out the Status of ICT in the Government Higher Secondary Schools (GHSS)

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.1 clearly depicts the Status of ICT in GHSS. In all the GHSS, the Status of ICT items such as Computer, Video-Cassette, CD-Player, DVD-Player, CD/DVD was (53.3%) and the items such as Internet, T.V and Radio was (11.1%), Projector was (6.7%), Film was (84.4%) and the other items like LCD Projector, Slide-Projector, Film-Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference, Video-Conference were not available in the schools as the percentage was zero. The items like Tape-recorder, Audio-Cassette, Loud-Speaker, Blackboard, Whiteboard, Chart, and Calculator were available in all the Government

Higher Secondary Schools as the percentage was 100. It is evidently portrayed in the (Figure 4.1.1).

**Table 4.1.1**

***Item wise Status of ICT in Government Higher Secondary Schools***

***(N=45)***

| S.no. | Name of Items | Percentage of ICT Status in GHSS |
|---|---|---|
| 1 | Computer | 53.3% |
| 2 | Internet | 11.1% |
| 3 | Projector | 6.7% |
| 4 | LCD Projector | 0% |
| 5 | Slide Projector | 0% |
| 6 | Film | 84.4% |
| 7 | Film-Projector | 0% |
| 8 | Epidiascope | 0% |
| 9 | Tape-recorder | 100% |
| 10 | Audio- Cassette | 100% |
| 11 | Video-Cassette | 53.3% |
| 12 | On-line teaching/learning | 0% |
| 13 | Blackboard | 100% |
| 14 | Smart-board | 0% |
| 15 | Whiteboard | 100% |
| 16 | CD-Player | 53.3% |
| 17 | DVD-Player | 53.3% |
| 18 | CD/DVD | 53.3% |
| 19 | Audio-Conference | 0% |
| 20 | Video-Conference | 0% |
| 21 | Loud-Speaker | 100% |
| 22 | T.V. | 11.1% |
| 23 | Radio | 11.1% |
| 24 | Chart | 100% |
| 25 | Calculator | 100% |

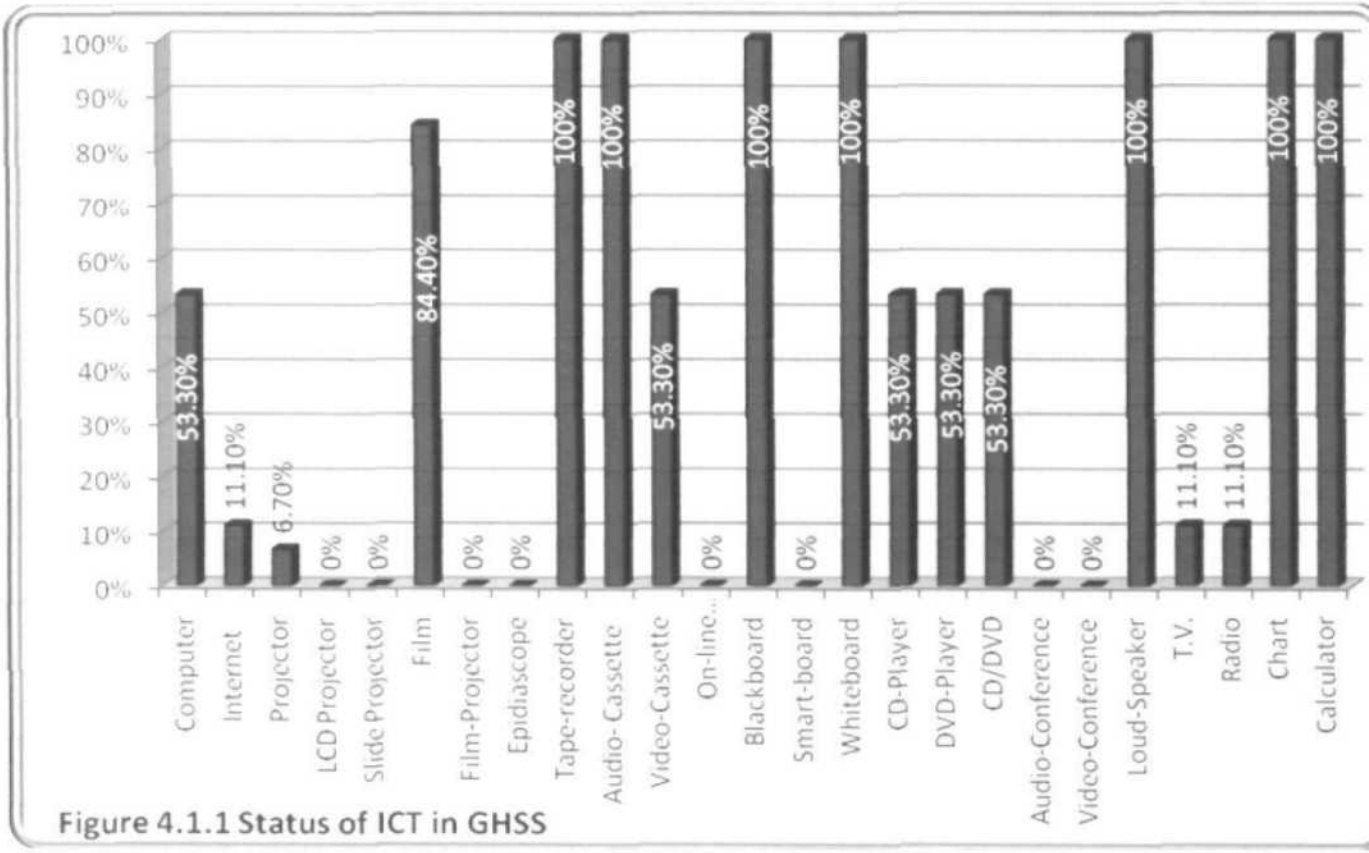


Figure 4.1.1 Status of ICT in GHSS

**4.1.1.1 To identify the Status of ICT in the Government Boys Higher Secondary Schools (GBHSS).**

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.1.1 clearly reveals the Status of ICT in GBHSS. In all the GBHSS, the Status of ICT items like Internet, Projector, T.V and Radio we (33.3%) and the other items like LCD Projector, Slide-Projector, Film-Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference, Video-Conference were not available in BHSS as the percentage was zero. The other items like Computer, Film, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, CD-Player, DVD-Player, CD/DVD, Loud-Speaker, Chart, and Calculator were available in all the GBHSS, as the percentage was 100.It is clearly represented in the (Figure 4.1.1.1).

## Table 4.1.1.1

***Item wise Status of ICT in Government Boys Higher Secondary Schools***

***(N=3)***

| S.no. | Name of Items | Percentage of ICT Status in GBHSS |
|---|---|---|
| 1 | Computer | 100% |
| 2 | Internet | 33.3% |
| 3 | Projector | 33.3% |
| 4 | LCD Projector | 0% |
| 5 | Slide Projector | 0% |
| 6 | Film | 100% |
| 7 | Film-Projector | 0% |
| 8 | Epidiascope | 0% |
| 9 | Tape-recorder | 100% |
| 10 | Audio- Cassette | 100% |
| 11 | Video-Cassette | 100% |
| 12 | On-line teaching/learning | 0% |
| 13 | Blackboard | 100% |
| 14 | Smart-board | 0% |
| 15 | Whiteboard | 100% |
| 16 | CD-Player | 100% |
| 17 | DVD-Player | 100% |
| 18 | CD/DVD | 100% |
| 19 | Audio-Conference | 0% |
| 20 | Video-Conference | 0% |
| 21 | Loud-Speaker | 100% |
| 22 | T.V. | 33.3% |
| 23 | Radio | 33.3% |
| 24 | Chart | 100% |
| 25 | Calculator | 100% |

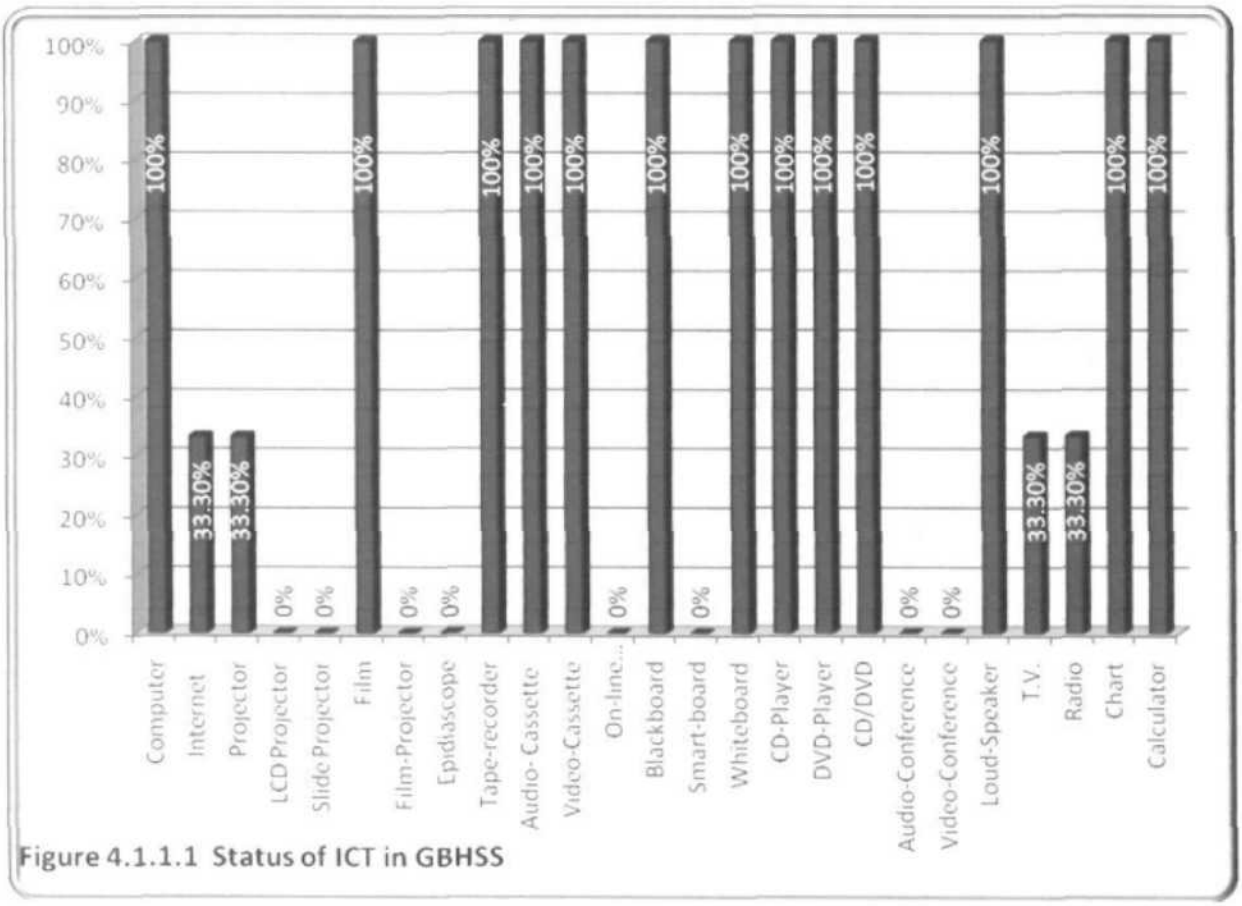

Figure 4.1.1.1 Status of ICT in GBHSS

**4.1.1.2 To identify the Status of ICT in the Government Girls Higher Secondary Schools (GGHSS).**

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.1.2 clearly represents the Status of ICT in GGHSS. In all the GGHSS, the Status of ICT items like Computer, Video-Cassette, CD-Player, DVD-Player, CD/DVD was (62.5%) and the status of the items like Internet, Projector, T.V and Radio was (12.5%). The items like LCD Projector, Slide Projector, Film-Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference and Video-Conference were not available, as the percentage was zero (0) whereas Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Loud-Speaker, Film, Chart, and Calculator were available in all the GGHSS as the percentage was 100.It is clearly shown in the graphical representation (Figure 4.1.1.2).

## Table 4.1.1.2

***Item wise Status of ICT in Government Girls Higher Secondary Schools***

***(N=8)***

| S.no. | Name of Items | Percentage of ICT Status in GGHSS |
|---|---|---|
| 1 | Computer | 62.5% |
| 2 | Internet | 12.5% |
| 3 | Projector | 12.5% |
| 4 | LCD Projector | 0% |
| 5 | Slide Projector | 0% |
| 6 | Film | 100% |
| 7 | Film-Projector | 0% |
| 8 | Epidiascope | 0% |
| 9 | Tape-recorder | 100% |
| 10 | Audio- Cassette | 100% |
| 11 | Video Cassette | 62.5% |
| 12 | On-line teaching/learning | 0% |
| 13 | Blackboard | 100% |
| 14 | Smart-board | 0% |
| 15 | Whiteboard | 100% |
| 16 | CD-Player | 62.5% |
| 17 | DVD-Player | 62.5% |
| 18 | CD/DVD | 62.5% |
| 19 | Audio-Conference | 0% |
| 20 | Video-Conference | 0% |
| 21 | Loud-Speaker | 100% |
| 22 | T.V. | 12.5% |
| 23 | Radio | 12.5% |
| 24 | Chart | 100% |
| 25 | Calculator | 100% |

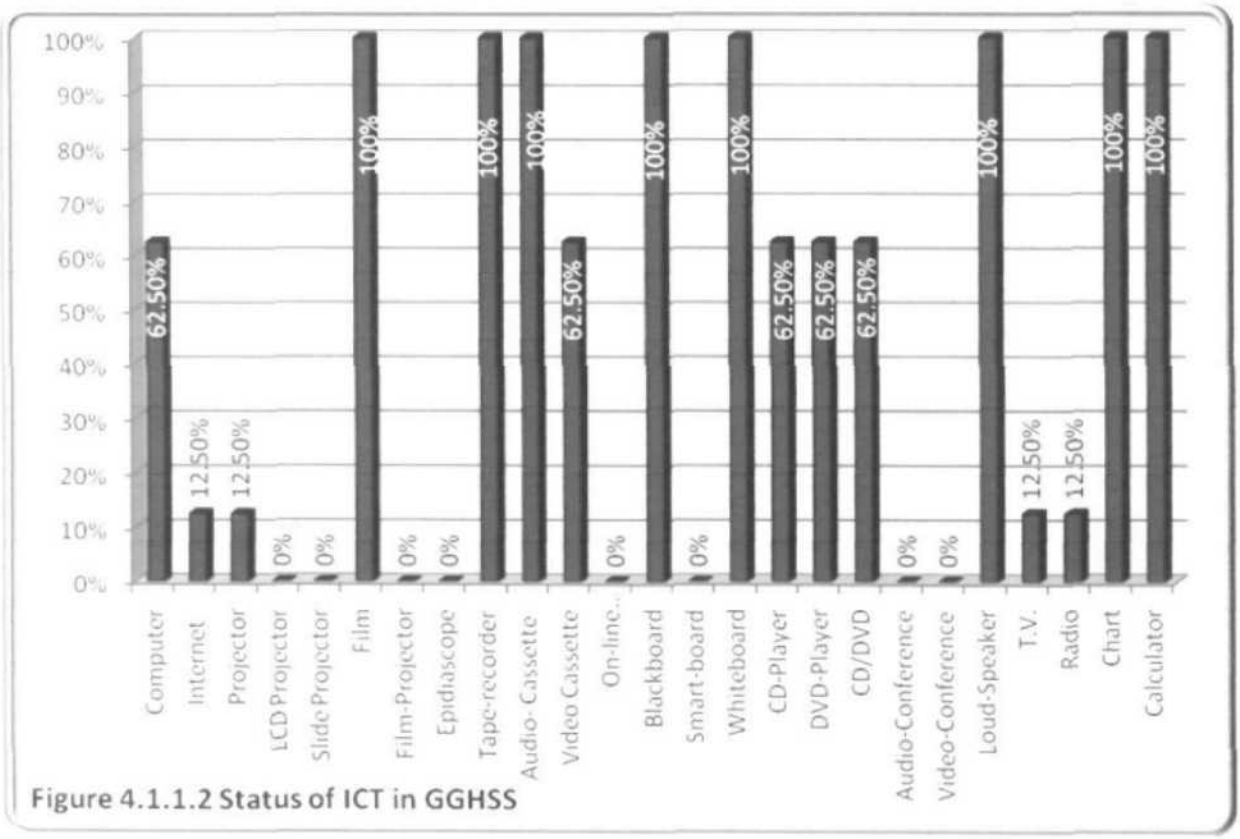

Figure 4.1.1.2 Status of ICT in GGHSS

### 4.1.1.3 To identify the Status of ICT in the Government Co-Educational Higher Secondary Schools (G (Co-Ed.) HSS).

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.1.3 clearly shows the Status of ICT in G (Co-Ed.) HSS. In all the G(Co-Ed.)HSS, the Status of ICT items such as Internet, T.V and Radio was (8.8%), Projector was (2.9%), Film was (79.4%) and the other items like Computer, Video-Cassette, CD-Player, DVD-Player, CD/DVD was (47.1%), whereas the items like LCD Projector, Slide Projector, Film-Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference, Video-Conference were not available as the percentage was zero (0). The other items like Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Loud-Speaker, Chart, and Calculator were available in all the G (Co-Ed.) HSS as the percentage was 100.It is clearly represented in the graph (Figure 4.1.1.3).

## Table 4.1.1.3

***Item wise Status of ICT in Government Co-Educational Higher Secondary Schools (N=34)***

| S.no. | Name of Items | Percentage of ICT in G (Co-Ed.) HSS |
|---|---|---|
| 1 | Computer | 47.1% |
| 2 | Internet | 8.8% |
| 3 | Projector | 2.9% |
| 4 | LCD Projector | 0% |
| 5 | Slide Projector | 0% |
| 6 | Film | 79.4% |
| 7 | Film-Projector | 0% |
| 8 | Epidiascope | 0% |
| 9 | Tape-recorder | 100% |
| 10 | Audio- Cassette | 100% |
| 11 | Video Cassette | 47.1% |
| 12 | On-line teaching/learning | 0% |
| 13 | Blackboard | 100% |
| 14 | Smart-board | 0% |
| 15 | Whiteboard | 100% |
| 16 | CD-Player | 47.1% |
| 17 | DVD-Player | 47.1% |
| 18 | CD/DVD | 47.1% |
| 19 | Audio-Conference | 0% |
| 20 | Video-Conference | 0% |
| 21 | Loud-Speaker | 100% |
| 22 | T.V. | 8.8% |
| 23 | Radio | 8.8% |
| 24 | Chart | 100% |
| 25 | Calculator | 100% |

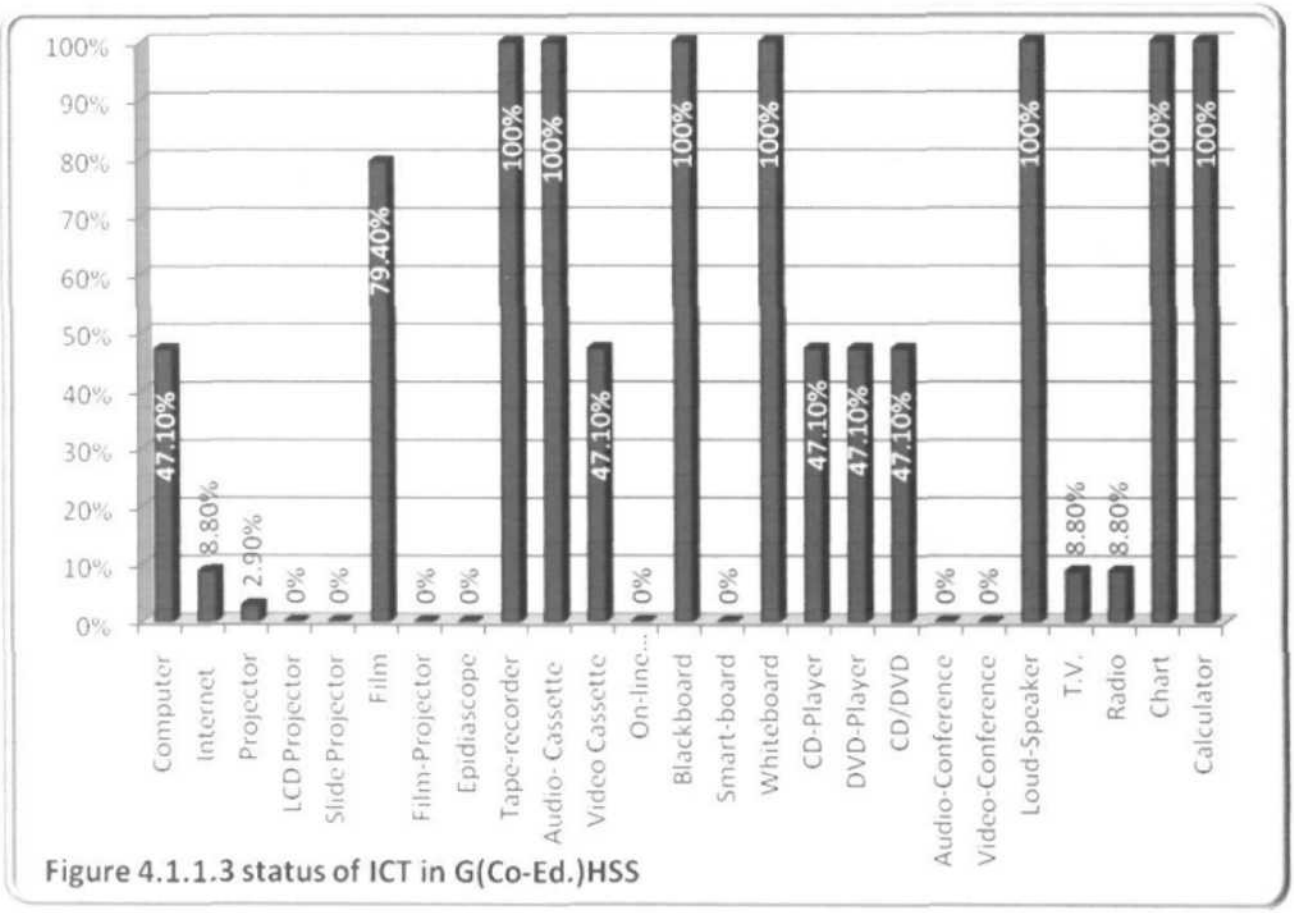

Figure 4.1.1.3 status of ICT in G(Co-Ed.)HSS

### 4.1.1.4 Comparison of Status among all Government Higher Secondary Schools (GHSS).

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.1.4 describes the comparison of the Status of ICT in all Government Higher Secondary Schools as it revealed that among these schools the percentage of Computer, Internet, Video-Cassette, CD-Player, DVD-Player, CD/DVD, Projector, T.V and Radio was highest in GBHSS and the table also showed that availability of the Film was low in G (Co-Ed.) HSS as compared to GBHSS and GGHSS, whereas as the percentage of the items like Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, LCD Projector, Slide Projector, Film-Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference, Video-Conference, Loud-Speaker, Chart and Calculator was same in all these three types of schools which is evident from the graphical representation (Figure 4.1.1.4).

## Table 4.1.1.4

***Item wise comparison of ICT Status in Government***

***(BHSS, GHSS and Co-Ed. HSS)***

| S.no. | Name of Items | GBHSS | GGHSS | G Co-Ed. HSS |
|---|---|---|---|---|
| 1 | Computer | 100% | 62.5% | 47.1% |
| 2 | Internet | 33.3% | 12.5% | 8.8% |
| 3 | Projector | 33.3% | 12.5% | 2.9% |
| 4 | LCD Projector | 0% | 0% | 0% |
| 5 | Slide Projector | 0% | 0% | 0% |
| 6 | Film | 100% | 100% | 79.4% |
| 7 | Film-Projector | 0% | 0% | 0% |
| 8 | Epidiascope | 0% | 0% | 0% |
| 9 | Tape-recorder | 100% | 100% | 100% |
| 10 | Audio- Cassette | 100% | 100% | 100% |
| 11 | Video Cassette | 100% | 62.5% | 47.1% |
| 12 | On-line teaching/learning | 0% | 0% | 0% |
| 13 | Blackboard | 100% | 100% | 100% |
| 14 | Smart-board | 0% | 0% | 0% |
| 15 | Whiteboard | 100% | 100% | 100% |
| 16 | CD-Player | 100% | 62.5% | 47.1% |
| 17 | DVD-Player | 100% | 62.5% | 47.1% |
| 18 | CD/DVD | 100% | 62.5% | 47.1% |
| 19 | Audio-Conference | 0% | 0% | 0% |
| 20 | Video-Conference | 0% | 0% | 0% |
| 21 | Loud-Speaker | 100% | 100% | 100% |
| 22 | T.V. | 33.3% | 12.5% | 8.8% |
| 23 | Radio | 33.3% | 12.5% | 8.8% |
| 24 | Chart | 100% | 100% | 100% |
| 25 | Calculator | 100% | 100% | 100% |

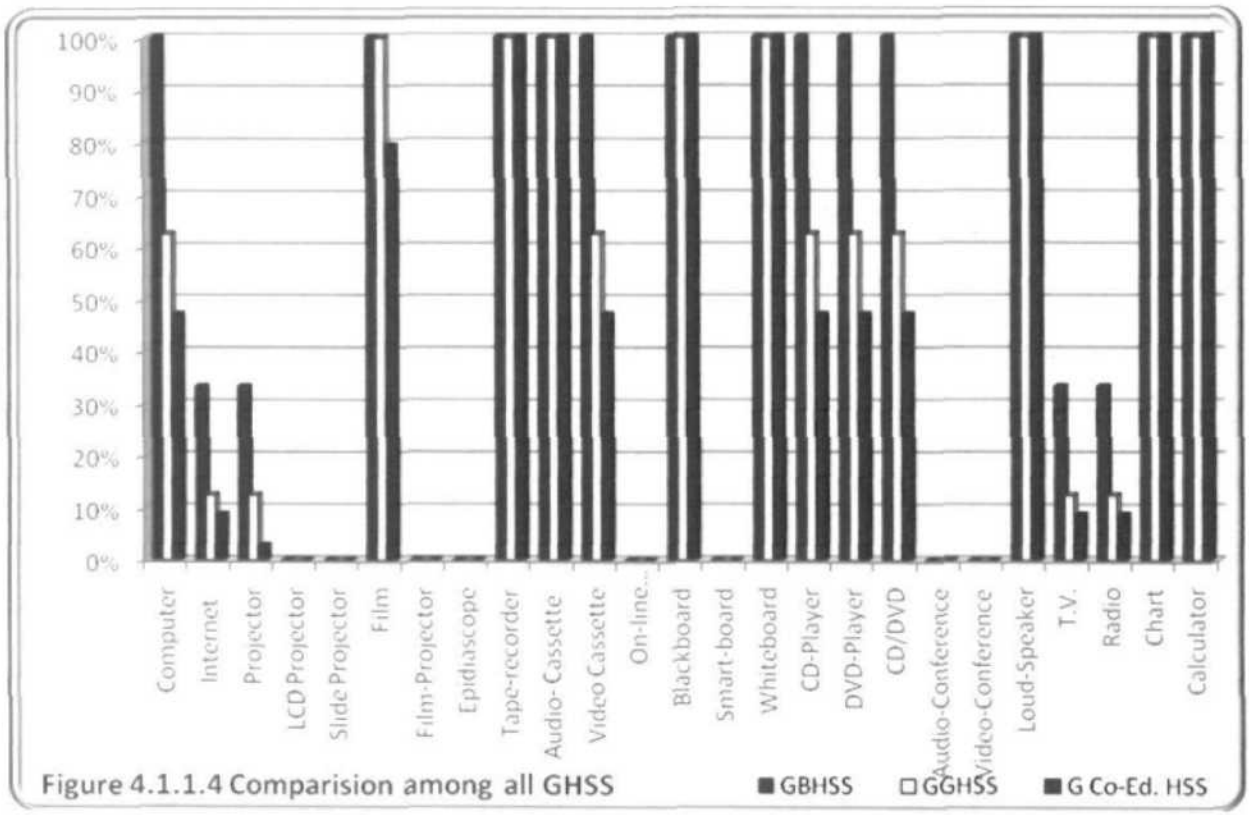


Figure 4.1.1.4 Comparision among all GHSS

### 4.1.2 To identify the Status of ICT in the Private Higher Secondary Schools (PHSS).

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.2 clearly depicts the Status of ICT in PHSS. In all the PHSS, the Status of ICT items like Internet and Radio was (62.5%), Projector, Film-Projector, CD-Player, DVD-Player, CD/DVD was (50%), Loud-Speaker was (87.5%) and other items like LCD Projector, Slide-Projector, Epidiascope, On-line teaching/learning, Smart-board, Audio-Conference, Video-Conference were not available as the percentage was zero (0) and the items like Computer, Film, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, T.V, Chart, Calculator were available in all the Private Higher Secondary Schools, as the percentage was 100.It is clearly evident in the (Figure 4.1.2).

## Table 4.1.2

***Item wise Status of ICT in Private Higher Secondary Schools***

***(N=08)***

| S.no. | Name of Items | Percentage of ICT Status in PHSS |
|---|---|---|
| 1 | Computer | 100% |
| 2 | Internet | 62.5% |
| 3 | Projector | 50% |
| 4 | LCD Projector | 0% |
| 5 | Slide Projector | 0% |
| 6 | Film | 100% |
| 7 | Film-Projector | 50% |
| 8 | Epidiascope | 0% |
| 9 | Tape-recorder | 100% |
| 10 | Audio- Cassette | 100% |
| 11 | Video Cassette | 100% |
| 12 | On-line teaching/learning | 0% |
| 13 | Blackboard | 100% |
| 14 | Smart-board | 0% |
| 15 | Whiteboard | 100% |
| 16 | CD-Player | 50% |
| 17 | DVD-Player | 50% |
| 18 | CD/DVD | 50% |
| 19 | Audio-Conference | 0% |
| 20 | Video-Conference | 0% |
| 21 | Loud-Speaker | 87.5% |
| 22 | T.V. | 100% |
| 23 | Radio | 62.5% |
| 24 | Chart | 100% |
| 25 | Calculator | 100% |

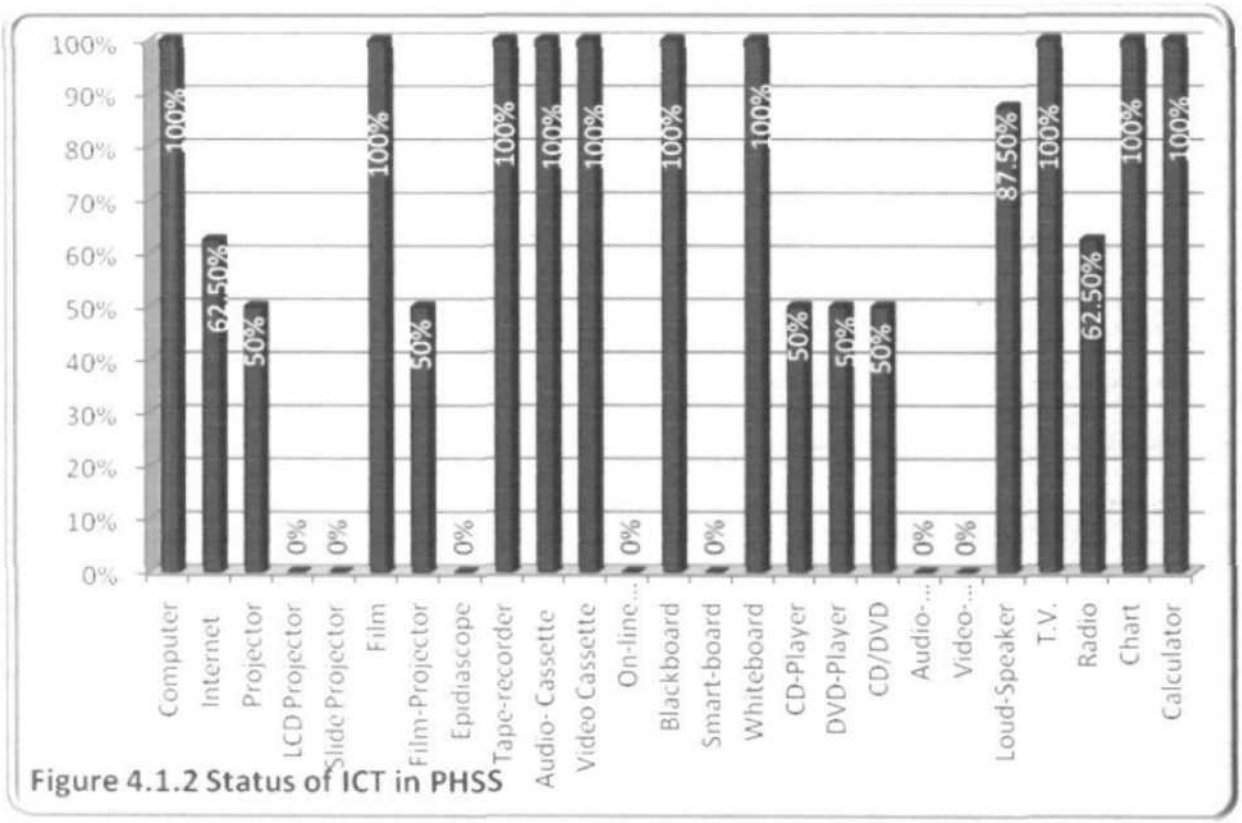

Figure 4.1.2 Status of ICT in PHSS

### 4.1.2.1 To identify the Status of ICT in the Private Boys Higher Secondary Schools (PBHSS).

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.2.1 shows that in PBHSS the Status of ICT items such as Computer, Internet, Projector, Film, Film-Projector, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, CD- Player, DVD-Player, CD/DVD, Loud-Speaker, T.V, Radio, Chart and Calculator was (100%) and other items like, LCD Projector, Slide Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference and Video-Conference were not available in the PBHSS as the percentage was zero (0) which is clearly represented in the (Figure 4.1.2.1).

## Table 4.1.2.1

***Item wise Status of ICT in Private Boys Higher Secondary Schools***

*(N=1)*

| .no. | Name of Items | Percentage of ICT Status in PBHSS |
|---|---|---|
| | Computer | 100% |
| 2 | Internet | 100% |
| 3 | Projector | 100% |
| 4 | LCD Projector | 0% |
| 5 | Slide Projector | 0% |
| 6 | Film | 100% |
| 7 | Film-Projector | 100% |
| 8 | Epidiascope | 0% |
| 9 | Tape-recorder | 100% |
| 10 | Audio- Cassette | 100% |
| 11 | Video- Cassette | 100% |
| 12 | On-line teaching/learning | 0% |
| 13 | Blackboard | 100% |
| 14 | Smart-board | 0% |
| 15 | Whiteboard | 100% |
| 16 | CD-Player | 100% |
| 17 | DVD-Player | 100% |
| 18 | CD/DVD | 100% |
| 19 | Audio-Conference | 0% |
| 20 | Video-Conference | 0% |
| 21 | Loud-Speaker | 100% |
| 22 | T.V. | 100% |
| 23 | Radio | 100% |
| 24 | Chart | 100% |
| 25 | Calculator | 100% |

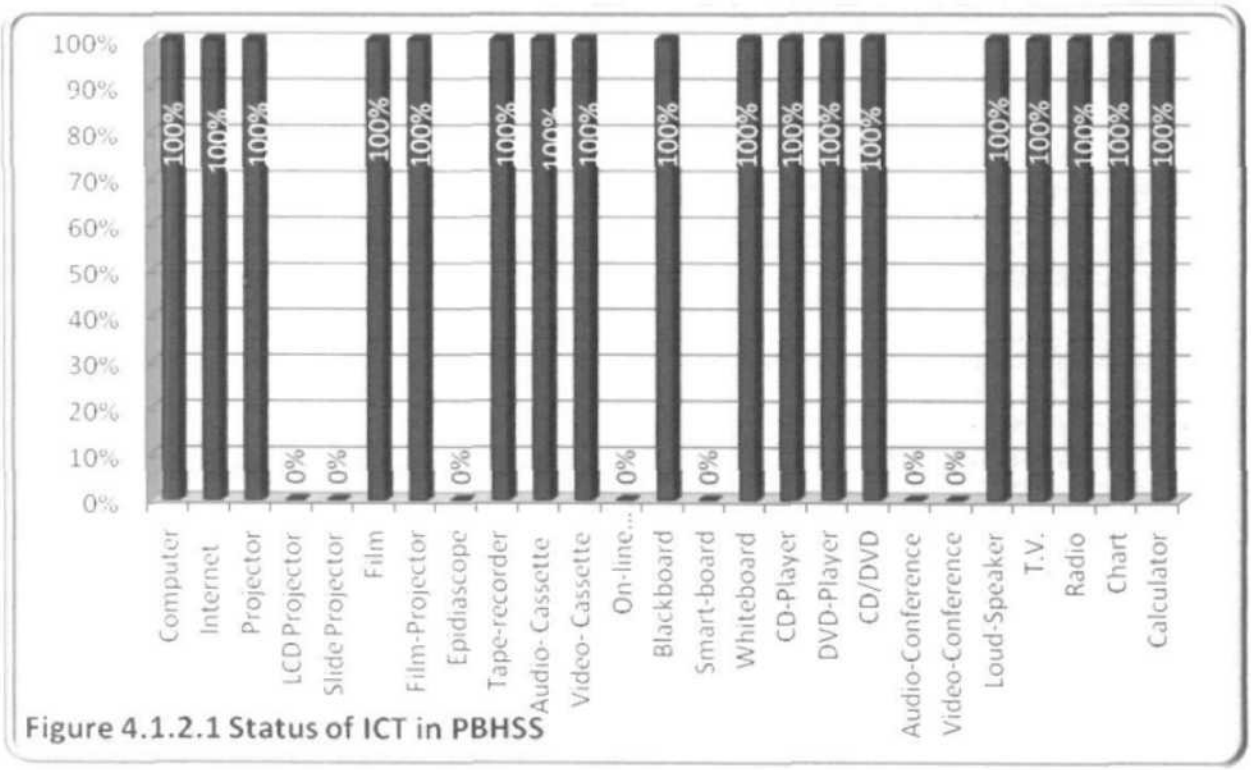

Figure 4.1.2.1 Status of ICT in PBHSS

**4.1.2.2 To identify the Status of ICT in the Private Girls Higher Secondary Schools (PGHSS).**

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.2.2 shows that in PGHSS the Status of ICT items such as Computer, Internet, Projector, Film, Film-Projector, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, CD-Player, DVD-Player, CD/DVD, Loud-Speaker, T.V, Radio, Chart and Calculator was (100%) and other items like LCD Projector, Slide Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference and Video-Conference were not available, as the percentage was zero which is clearly evident in the (Figure 4.1.2.2).

## Table 4.1.2.2

***Item wise Status of ICT in Private Girls Higher Secondary Schools***

***(N=1)***

| S.no. | Name of Items | Percentage of ICT Status in PGHSS |
|---|---|---|
| 1 | Computer | 100% |
| 2 | Internet | 100% |
| 3 | Projector | 100% |
| 4 | LCD Projector | 0% |
| 5 | Slide Projector | 0% |
| 6 | Film | 100% |
| 7 | Film-Projector | 100% |
| 8 | Epidiascope | 0% |
| 9 | Tape-recorder | 100% |
| 10 | Audio- Cassette | 100% |
| 11 | Video Cassette | 100% |
| 12 | On-line teaching/learning | 0% |
| 13 | Blackboard | 100% |
| 14 | Smart-board | 0% |
| 15 | Whiteboard | 100% |
| 16 | CD-Player | 100% |
| 17 | DVD-Player | 100% |
| 18 | CD/DVD | 100% |
| 19 | Audio-Conference | 0% |
| 20 | Video-Conference | 0% |
| 21 | Loud-Speaker | 100% |
| 22 | T.V. | 100% |
| 23 | Radio | 100% |
| 24 | Chart | 100% |
| 25 | Calculator | 100% |

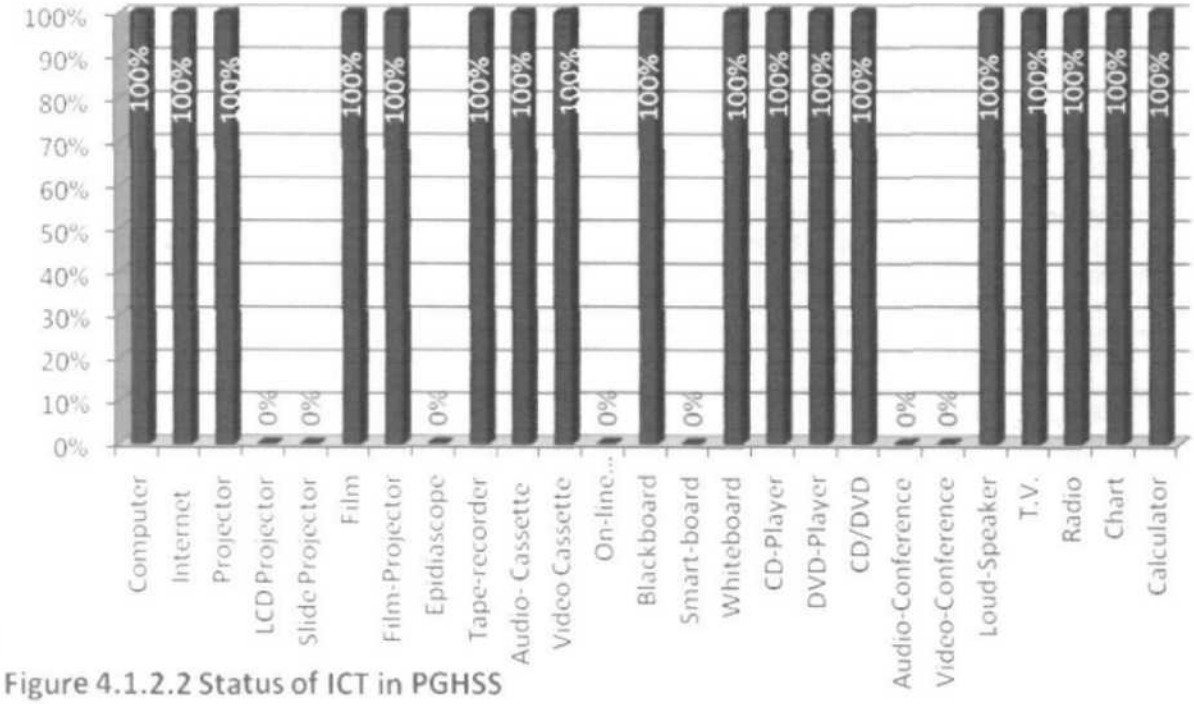


Figure 4.1.2.2 Status of ICT in PGHSS

### 4.1.2.3 To identify the Status of ICT in the Private Co-Educational Higher Secondary Schools (P (Co-Ed.) HSS)

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.2.3 clearly shows the Status of ICT in P (Co-Ed.) HSS. In all the P (Co-Ed.) HSS, the Status of ICT items like Internet and Radio was (50%), Projector, Film-Projector, CD-Player, DVD-Player, CD/DVD was (33.3%), Loud-Speaker (83.3%) and other items like LCD Projector, Slide-Projector Epidiascope, On-line-teaching/ learning, Smart-board, Audio-Conference, Video-Conference and the items like Computer, Film, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, T.V, Chart, Calculator were available in Private schools as the percentage was 100.It is clearly represented in the (Figure 4.1.2.3).

## Table 4.1.2.3

***Item wise Status of ICT in Private Co-Educational Higher Secondary Schools***

***(N=6)***

| S.no. | Name of Items | Percent ICT in P (Co-Ed.) HSS |
|---|---|---|
| 1 | Computer | 100% |
| 2 | Internet | 50% |
| 3 | Projector | 33.3% |
| 4 | LCD Projector | 0% |
| 5 | Slide Projector | 0% |
| 6 | Film | 100% |
| 7 | Film-Projector | 33.3% |
| 8 | Epidiascope | 0% |
| 9 | Tape-recorder | 100% |
| 10 | Audio- Cassette | 100% |
| 11 | Video Cassette | 100% |
| 12 | On-line teaching/learning | 0% |
| 13 | Blackboard | 100% |
| 14 | Smart-board | 0% |
| 15 | Whiteboard | 100% |
| 16 | CD-Player | 33.3% |
| 17 | DVD-Player | 33.3% |
| 18 | CD/DVD | 33.3% |
| 19 | Audio-Conference | 0% |
| 20 | Video-Conference | 0% |
| 21 | Loud-Speaker | 83.3% |
| 22 | T.V. | 100% |
| 23 | Radio | 50% |
| 24 | Chart | 100% |
| 25 | Calculator | 100% |

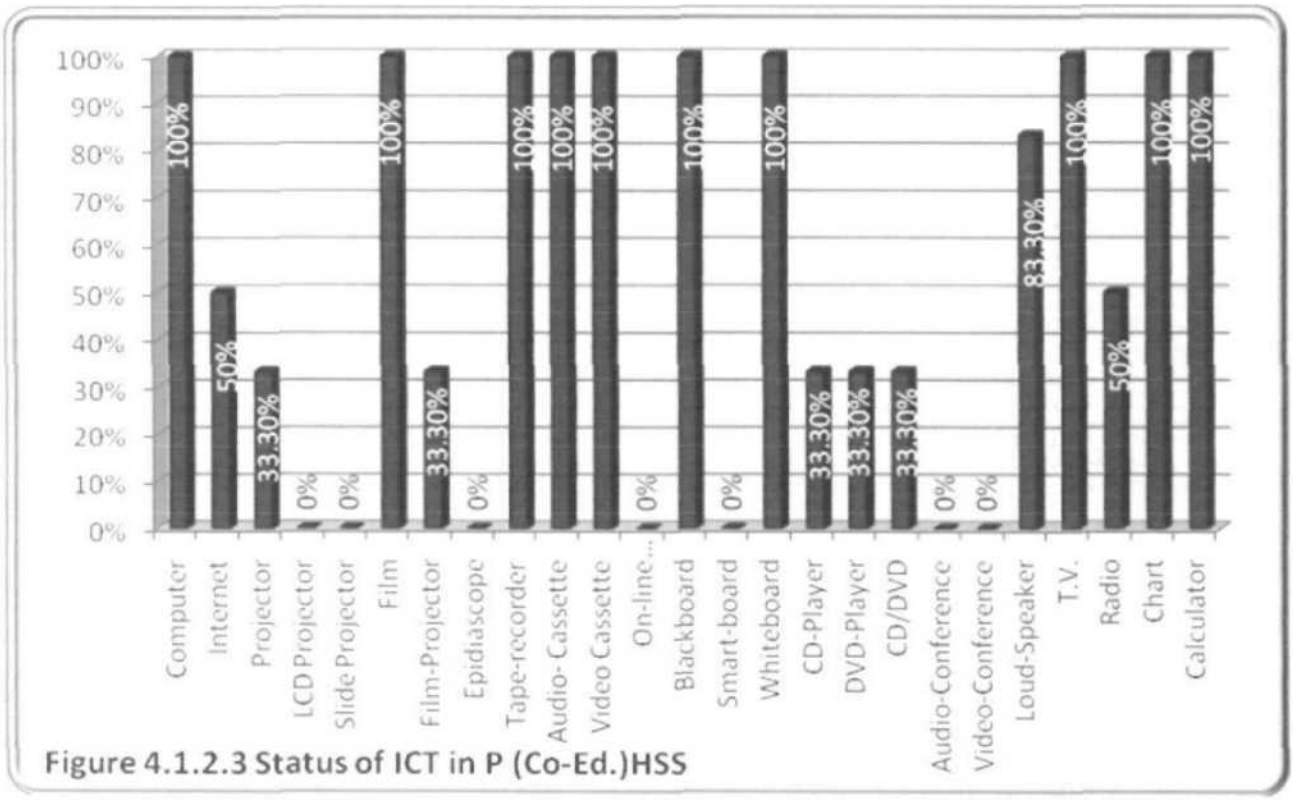

Figure 4.1.2.3 Status of ICT in P (Co-Ed.)HSS

### 4.1.2.4 Comparison of Status of ICT among all Private Higher Secondary Schools (PHSS)

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.2.4 describes the comparison of the Status of ICT among Private Boys, Private Girls and Private Co-Educational Higher Secondary Schools. There was no difference in the Status of ICT items between PBHSS and PGHSS, as the percentage of all the items was same. While as in case of P(Co-Ed.) HSS, the Status of ICT items like Internet, Projector, Film-Projector, CD-Player, DVD-Player, CD/DVD, Loud-Speaker and Radio was low as compared to PBHSS and PGHSS It is clearly evident in the (Figure 4.1.2.4).

## Table 4.1.2.4

***Item wise comparison of ICT Status in Private***

***(BHSS, GHSS and Co-Ed. HSS)***

| S.no. | Name of Items | PBHSS | PGHSS | P Co-Ed. HSS |
|---|---|---|---|---|
| 1 | Computer | 100% | 100% | 100% |
| 2 | Internet | 100% | 100% | 50% |
| 3 | Projector | 100% | 100% | 33.3% |
| 4 | LCD Projector | 0% | 0% | 0% |
| 5 | Slide Projector | 0% | 0% | 0% |
| 6 | Film | 100% | 100% | 100% |
| 7 | Film-Projector | 100% | 100% | 33.3% |
| 8 | Epidiascope | 0% | 0% | 0% |
| 9 | Tape-recorder | 100% | 100% | 100% |
| 10 | Audio- Cassette | 100% | 100% | 100% |
| 11 | Video Cassette | 100% | 100% | 100% |
| 12 | On-line teaching/learning | 0% | 0% | 0% |
| 13 | Blackboard | 100% | 100% | 100% |
| 14 | Smart-board | 0% | 0% | 0% |
| 15 | Whiteboard | 100% | 100% | 100% |
| 16 | CD-Player | 100% | 100% | 33.3% |
| 17 | DVD-Player | 100% | 100% | 33.3% |
| 18 | CD/DVD | 100% | 100% | 33.3% |
| 19 | Audio-Conference | 0% | 0% | 0% |
| 20 | Video-Conference | 0% | 0% | 0% |
| 21 | Loud-Speaker | 100% | 100% | 83.3% |
| 22 | T.V. | 100% | 100% | 100% |
| 23 | Radio | 100% | 100% | 50% |
| 24 | Chart | 100% | 100% | 100% |
| 25 | Calculator | 100% | 100% | 100% |

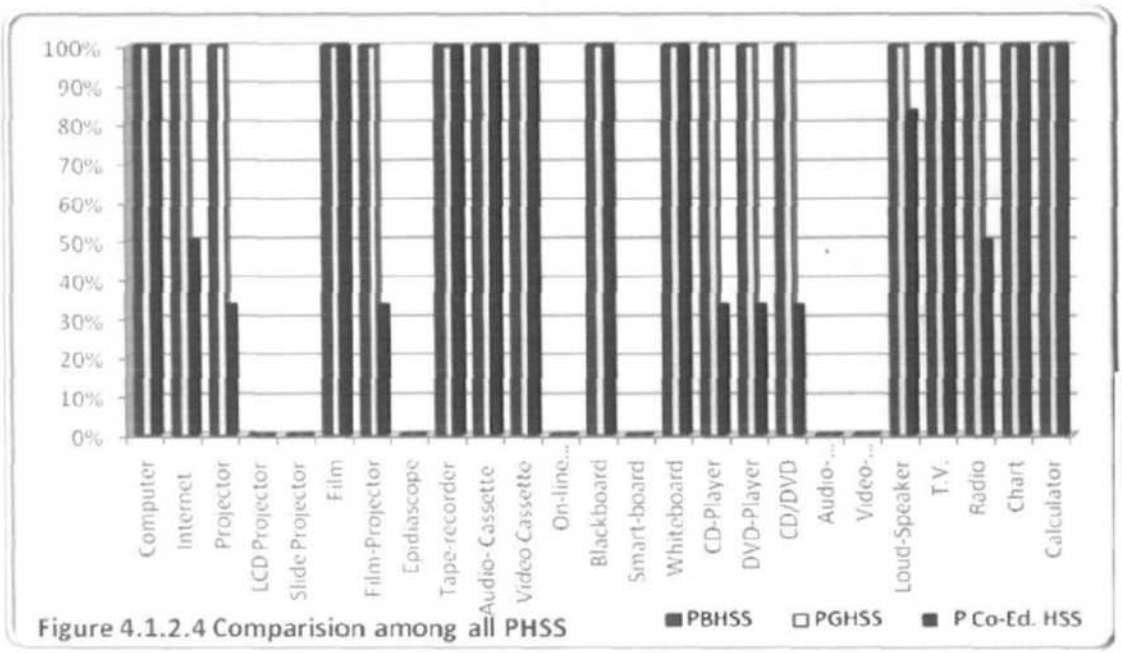


Figure 4.1.2.4 Comparision among all PHSS

### 4.1.3 Comparison between the Status of ICT in Government and Private Higher Secondary Schools.

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table no. 4.1.3 depicts the comparison of the Status of ICT between the Government and the Private Higher Secondary Schools. There was no difference in the Status of some ICT items such as Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Chart and Calculator, as the percentage of these items was same in both the schools while as there was high percentage of the other ICT items in PHSS as compared to GHSS. The Figure (4.1.3) makes it quite clear.

## Table 4.1.3

***Item wise comparison of ICT in Government and Private Higher Secondary Schools***

| S.no. | Name of Items | Government HSS | Private HSS |
|---|---|---|---|
| 1 | Computer | 53.3% | 100% |
| 2 | Internet | 11.1% | 62.5% |
| 3 | Projector | 6.7% | 50% |
| 4 | LCD Projector | 0% | 0% |
| 5 | Slide Projector | 0% | 0% |
| 6 | Film | 84.4% | 100% |
| 7 | Film-Projector | 0% | 50% |
| 8 | Epidiascope | 0% | 0% |
| 9 | Tape-recorder | 100% | 100% |
| 10 | Audio- Cassette | 100% | 100% |
| 11 | Video Cassette | 53.3% | 100% |
| 12 | On-line teaching/learning | 0% | 0% |
| 13 | Blackboard | 100% | 100% |
| 14 | Smart-board | 0% | 0% |
| 15 | Whiteboard | 100% | 100% |
| 16 | CD-Player | 53.3% | 50% |
| 17 | DVD-Player | 53.3% | 50% |
| 18 | CD/DVD | 53.3% | 50% |
| 19 | Audio-Conference | 0% | 0% |
| 20 | Video-Conference | 0% | 0% |
| 21 | Loud-Speaker | 100% | 87.5% |
| 22 | T.V. | 11.1% | 100% |
| 23 | Radio | 11.1% | 62.5% |
| 24 | Chart | 100% | 100% |
| 25 | Calculator | 100% | 100% |

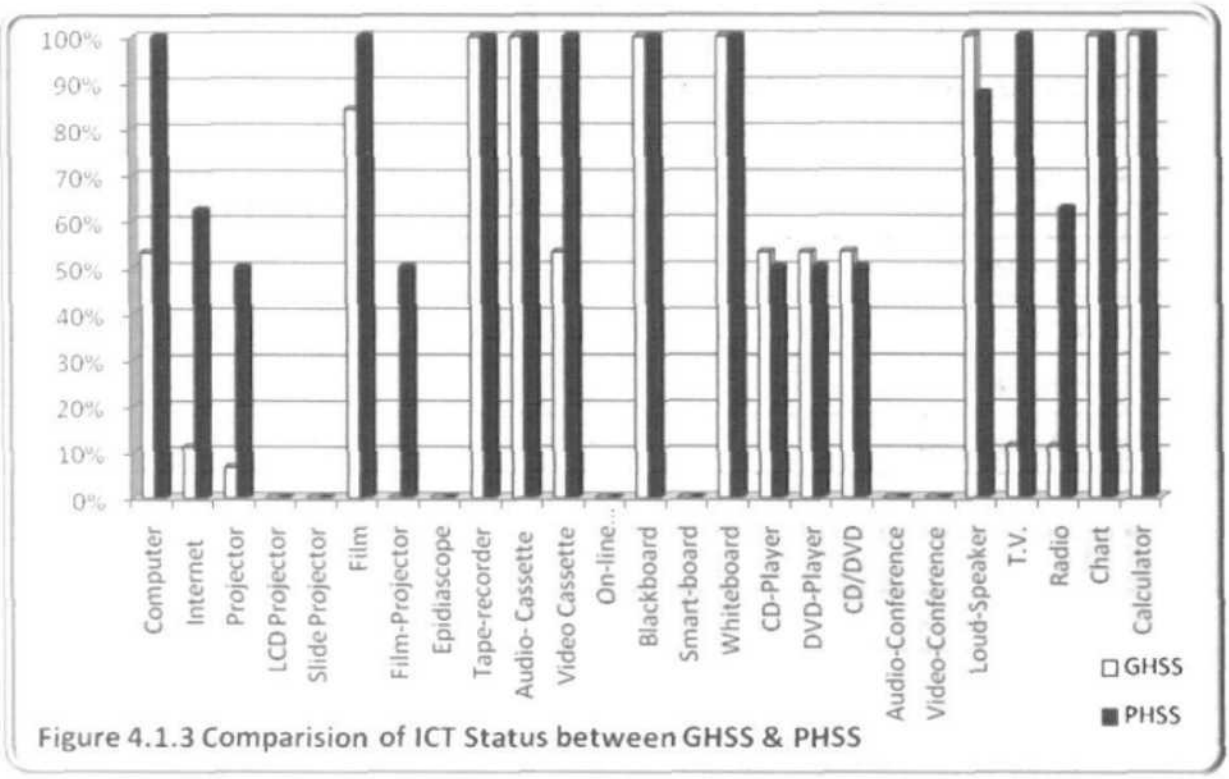

Figure 4.1.3 Comparision of ICT Status between GHSS & PHSS

### 4.1.3.1 Comparison between the Status of ICT in Government and Private Boys Higher Secondary Schools

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.3.1 reveals the comparison of the Status of ICT between the Government and the Private Boys Higher Secondary Schools. There was no difference in the Status of some ICT items like Computer, LCD Projector, Slide-Projector, Film, Epidiascope, Tape-recorder, Audio-Cassette, Video-Cassette, On-line-teaching/learning, Blackboard, Smart-board, Whiteboard, CD-Player, DVD-Player, CD/DVD, Audio-Conference, Video-Conference, Loud-Speaker, Chart and Calculator as the percentage of these items was same in both the schools while as the Status of the other items was high in PBHSS as compared to GBHSS. The graphical representation (Figure 4.1.3.1) makes it quite clear.

## Table 4.1.3.1

***Item wise comparison of ICT in Government and Private Boys Higher Secondary School***

| S.no. | Name of Items | Government Boys HSS | Private Boys HSS |
|---|---|---|---|
| 1 | Computer | 100% | 100% |
| 2 | Internet | 87.5% | 100% |
| 3 | Projector | 87.5% | 100% |
| 4 | LCD Projector | 0% | 0% |
| 5 | Slide Projector | 0% | 0% |
| 6 | Film | 100% | 100% |
| 7 | Film-Projector | 0% | 100% |
| 8 | Epidiascope | 0% | 0% |
| 9 | Tape-recorder | 100% | 100% |
| 10 | Audio- Cassette | 100% | 100% |
| 11 | Video Cassette | 100% | 100% |
| 12 | On-line teaching/learning | 0% | 0% |
| 13 | Blackboard | 100% | 100% |
| 14 | Smart-board | 0% | 0% |
| 15 | Whiteboard | 100% | 100% |
| 16 | CD-Player | 100% | 100% |
| 17 | DVD-Player | 100% | 100% |
| 18 | CD/DVD | 100% | 100% |
| 19 | Audio-Conference | 0% | 0% |
| 20 | Video-Conference | 0% | 0% |
| 21 | Loud-Speaker | 100% | 100% |
| 22 | T.V. | 33.3% | 100% |
| 23 | Radio | 33.3% | 100% |
| 24 | Chart | 100% | 100% |
| 25 | Calculator | 100% | 100% |

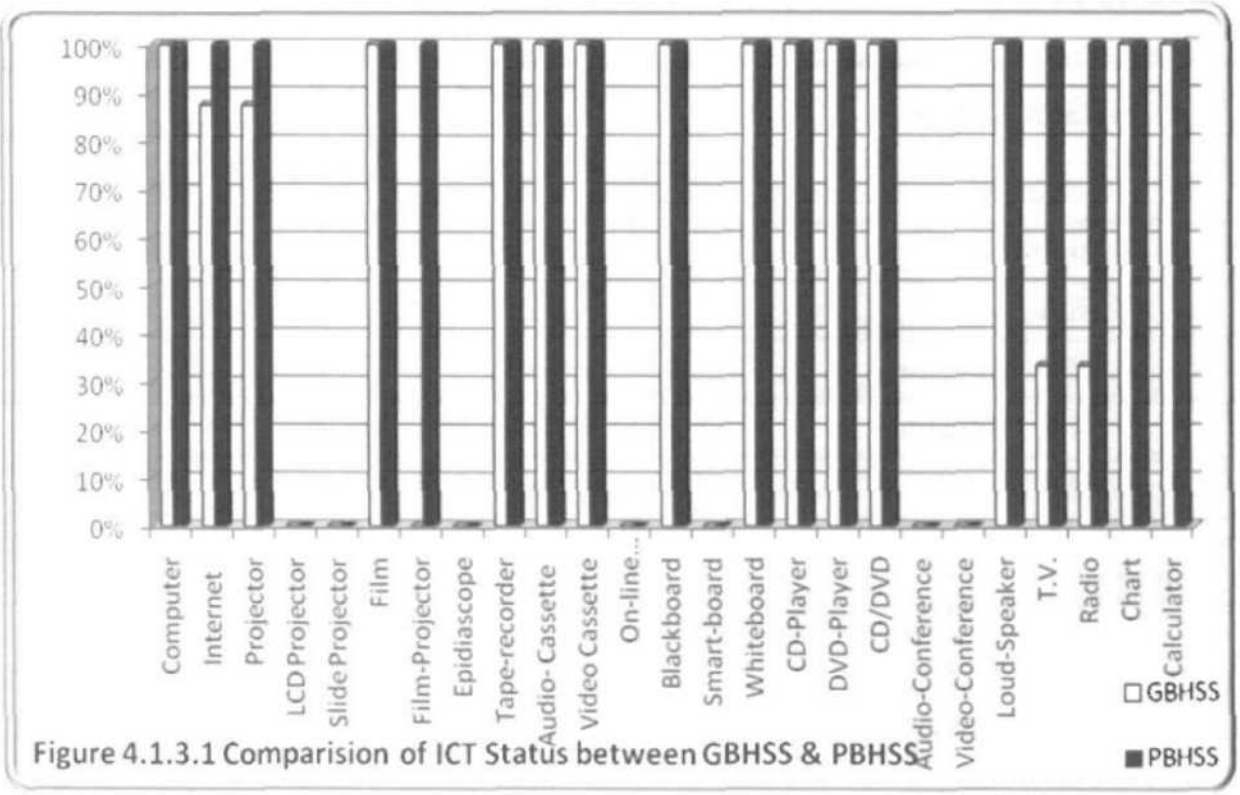


Figure 4.1.3.1 Comparision of ICT Status between GBHSS & PBHSS

### 4.1.3.2 Comparison between the Status of ICT in Government and Private Girls Higher Secondary Schools

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table 4.1.3.2 represents the comparison of the Status of ICT between the Government and the Private Girls Higher Secondary Schools. As per the result there was no difference in the Status of some ICT items like LCD Projector, Slide-Projector, Film, Epidiascope, Tape-recorder, Audio-Cassette, On-line-teaching/learning, Blackboard, Smart-board, Whiteboard, Audio-Conference, Video-Conference, Loud-Speaker, Chart and Calculator as the percentage of these items was same in both the schools while as there was high percentage of the other ten ICT items in PGHSS as compared to GGHSS. It is clearly evident in the Figure (4.1.3.2).

**Table 4.1.3.2**

***Item wise comparison of ICT in Government and Private Girls Higher Secondary Schools***

| S.no. | Name of Items | Government Girls HSS | Private Girls HSS |
|---|---|---|---|
| 1 | Computer | 62.5% | 100% |
| 2 | Internet | 12.5% | 100% |
| 3 | Projector | 12.5% | 100% |
| 4 | LCD Projector | 0% | 0% |
| 5 | Slide Projector | 0% | 0% |
| 6 | Film | 100% | 100% |
| 7 | Film-Projector | 0% | 100% |
| 8 | Epidiascope | 0% | 0% |
| 9 | Tape-recorder | 100% | 100% |
| 10 | Audio- Cassette | 100% | 100% |
| 11 | Video Cassette | 62.5% | 100% |
| 12 | On-line teaching/learning | 0% | 0% |
| 13 | Blackboard | 100% | 100% |
| 14 | Smart-board | 0% | 0% |
| 15 | Whiteboard | 100% | 100% |
| 16 | CD-Player | 62.5% | 100% |
| 17 | DVD-Player | 62.5% | 100% |
| 18 | CD/DVD | 62.5% | 100% |
| 19 | Audio-Conference | 0% | 0% |
| 20 | Video-Conference | 0% | 0% |
| 21 | Loud-Speaker | 100% | 100% |
| 22 | T.V. | 12.5% | 100% |
| 23 | Radio | 12.5% | 100% |
| 24 | Chart | 100% | 100% |
| 25 | Calculator | 100% | 100% |

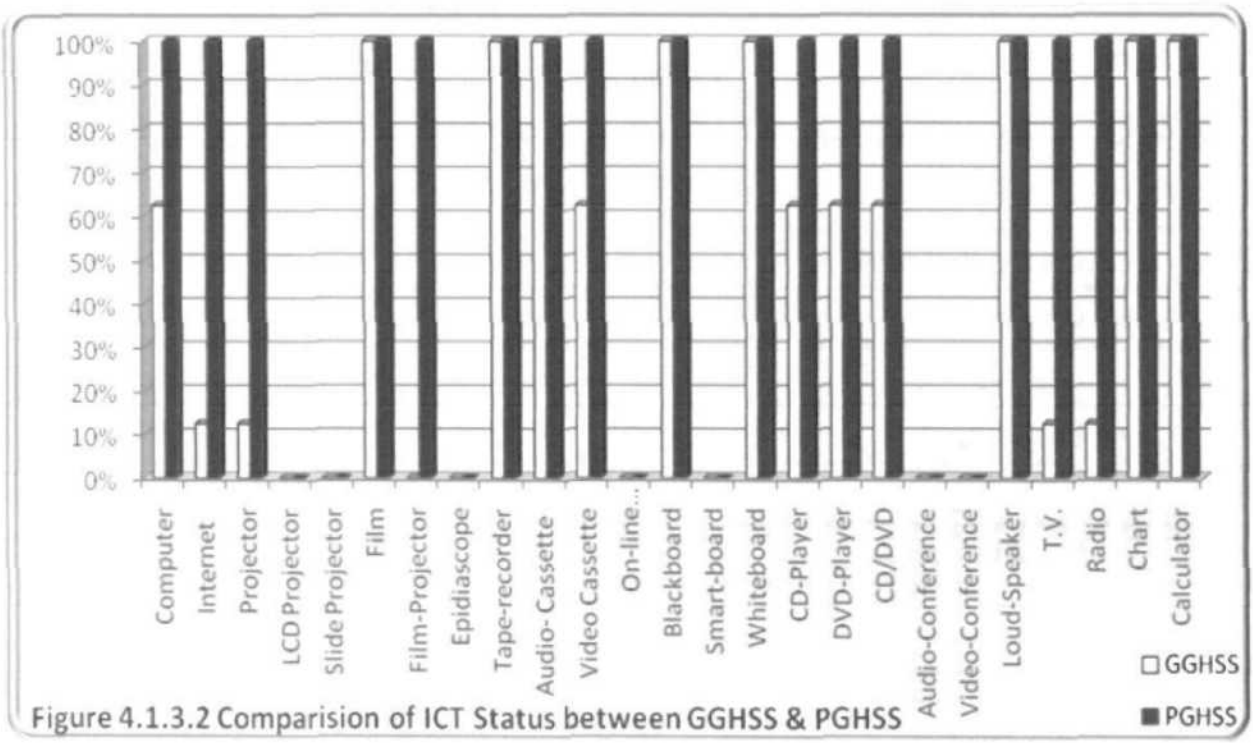


Figure 4.1.3.2 Comparision of ICT Status between GGHSS & PGHSS

### 4.1.3.3 Comparison between the Status of ICT in Government and Private Co-Educational Higher Secondary Schools

For achieving the above objective the Descriptive Statistics (percentage %) was used.

Table no. 4.1.3.3 shows the comparison of the Status of ICT between the Government and the Private Girls Higher Secondary Schools. As per the table there was no difference in the Status of some ICT items like LCD Projector, Slide-Projector, Epidiascope, Tape-recorder, Audio-Cassette, On-line-teaching/learning, Blackboard, Smart-board, Whiteboard, Audio-Conference, Video-Conference, Loud-Speaker, Chart and Calculator as the percentage of these items was same in both the schools while as the percentage of the ICT items like Computer, Internet, Projector, Film, Film-Projector, Video-Cassette, T.V, and Radio was higher in P(Co-Ed.)HSS as compared to G(Co-Ed.)HSS. On the other hand, the items like CD-Player, DVD-Player, CD/DVD and Loud-Speaker were slightly higher in G (Co-Ed.) HSS as compared to P (Co-Ed.) HSS. The Figure (4.1.3.3) makes it quite clear.

## Table 4.1.3.3

***Item wise comparison of ICT in Government and Private Co-Educational Higher Secondary Schools***

| S.no | Name of Items | G (Co-Ed.) HSS | P (Co-Ed.) HSS |
|---|---|---|---|
| 1 | Computer | 47.1% | 100% |
| 2 | Internet | 8.8% | 50% |
| 3 | Projector | 2.9% | 33.3% |
| 4 | LCD Projector | 0% | 0% |
| 5 | Slide Projector | 0% | 0% |
| 6 | Film | 79.4% | 100% |
| 7 | Film-Projector | 0% | 33.3% |
| 8 | Epidiascope | 0% | 0% |
| 9 | Tape-recorder | 100% | 100% |
| 10 | Audio- Cassette | 100% | 100% |
| 11 | Video Cassette | 47.1% | 100% |
| 12 | On-line teaching/learning | 0% | 0% |
| 13 | Blackboard | 100% | 100% |
| 14 | Smart-board | 0% | 0% |
| 15 | Whiteboard | 100% | 100% |
| 16 | CD-Player | 47.1% | 33.3% |
| 17 | DVD-Player | 47.1% | 33.3% |
| 18 | CD/DVD | 47.1% | 33.3% |
| 19 | Audio-Conference | 0% | 0% |
| 20 | Video-Conference | 0% | 0% |
| 21 | Loud-Speaker | 100% | 83.3% |
| 22 | T.V. | 8.8% | 100% |
| 23 | Radio | 8.8% | 50% |
| 24 | Chart | 100% | 100% |
| 25 | Calculator | 100% | 100% |

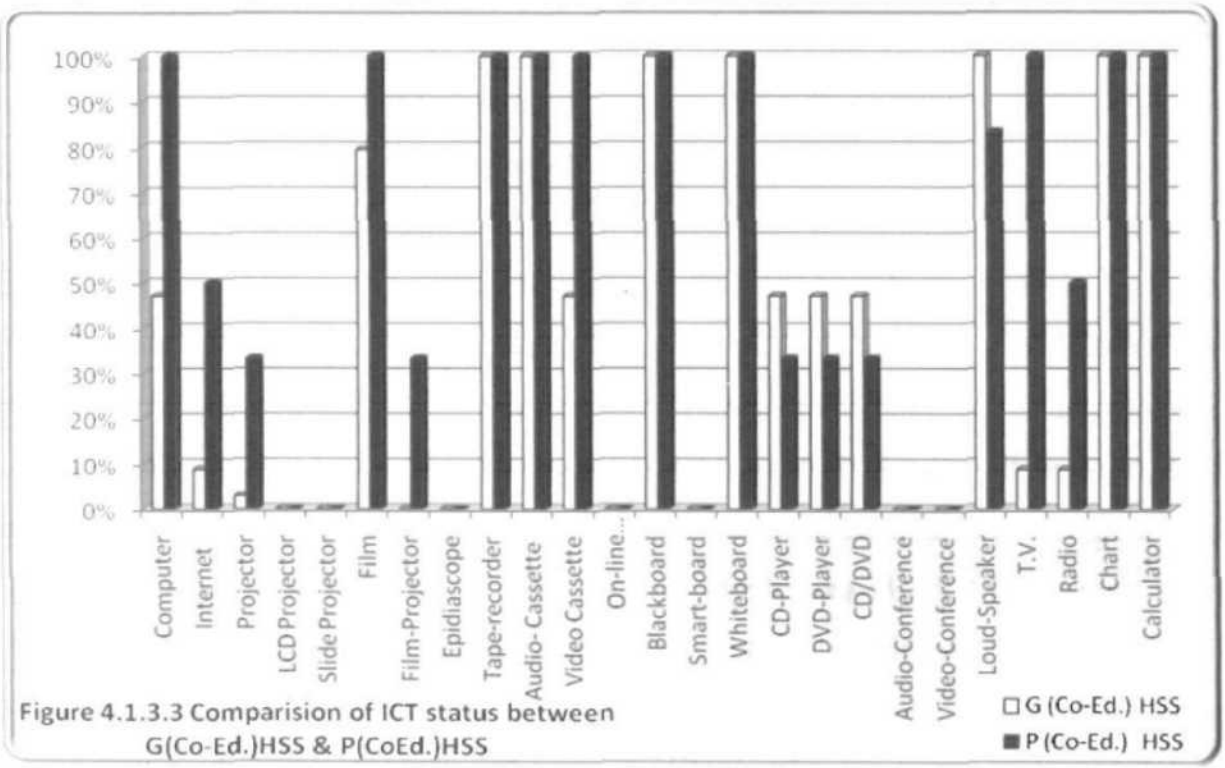


Figure 4.1.3.3 Comparision of ICT status between G(Co-Ed.)HSS & P(CoEd.)HSS

## Discussion:

### 4.1 Objective No.1: To identify the Status of ICT in Higher Secondary Schools (HSS).

Information and Communication Technology originally is applied to serve as a means of improving efficiency in the educational process. ICT enables us to make our learning process effective and motivation oriented. The quality of education and ICT is inseparable. However, improving the quality of education seems to be a critical issue, particularly at the time of educational expansion. ICTs are considered transformational tool which, when used aptly, can encourage the shift to a learner-centered environment. ICT in the field of teaching and learning is a growing area and has attracted the efforts of many educators in recent years.

In the present research investigation, obtained findings revealed the fact that the Status of ICT in Higher Secondary Schools (either Government or Private) was inadequate. The results clearly indicated that there was no availability of the ICT (hi-

tech) items such as LCD Projector, Slide-Projector, Film-Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference and Video-Conference. Therefore the results revealed the veto status of these ICT hi-tech items in almost all the Higher Secondary Schools. The results also revealed the squat of ICT items such as Computer, Film, Internet, Projector, Video-Cassette, CD-Player, DVD-Player, CD/DVD, Loud-Speaker, T.V. and Radio. The ICT items like Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Chart and Calculator were easily available which were traditionally used in the classrooms. The reason was that the ICT items were highly expensive and the schools were not in a position to procure these. It has been also observed that the ICT items like (Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Chart and Calculator) were less expensive and their maintenance was easier than that of the hi-tech items that is why the availability of these traditional items was higher than that of (hi-tech) or (modern items). A report of (ICT in School Education, 2010) supports the finding of the present study. It has been reported that availability of adequate infrastructure to support the deployment of ICTs in schools was a tremendous challenge that schools in the region currently faced. Apart from the high initial cost of purchasing and setting up the requisite infrastructure, the maintenance and upgrade costs, as well as the cost and effort of supporting such infrastructure were also roadblocks to the successful usage of ICTs in schools, especially in poor and remote areas.

In this technological age the teaching and learning process seems very difficult without ICT items. The results clearly depicted that the Status of ICT was not healthier in the Higher Secondary Schools of (District Anantnag) Jammu and Kashmir. But the results of comparisons between the Government Higher Secondary Schools and Private Higher Secondary Schools revealed that the Status of ICT was lower in the Government Schools as compared to the Private Schools, as the status of some very useful items like Internet, Projector, Film, T.V and Radio was low. Owing to this reason the Government Schools did not bring into play the ICT items fully in the schools. Several studies have been reported that the facilities of ICT were low in the schools. There was the absence of sufficient equipments and the materials in schools (Rao,1984). Private schools showed some sort of interest in inculcating the

new technologies for improving the teaching and learning process, so lot of fees were taken from the students to get ICT items for them. Private schooling is very much expensive than schooling in the Government schools according to data generated by NCERT survey (Indian Education Report 2002) and it has been recorded that the private schools have got good pass-out percentage as compared to government school as, "the pass percentage in the government schools could not cross the limit of 35% in Matriculation and 10+2 stage during the last decade, while the private institutions registered 75% pass percentage during the same period"(Gupta and Kapoor 2013).The Government schools are run by the State Government, and the Government of Jammu and Kashmir shows no interest in building up the modern technologies in Schools because of the lack of funds. As the study conducted by (SCERT, Orissa.1982) revealed that only 62% of high schools had radio sets, and 25% of high schools expressed inability to purchase radio sets due to non-receipts of circulars and non-availability of funds/ lack of funds. Central government is trying to improve the Education sector such as infrastructure in the schools, teacher training, improvise ICT. It has been highlighted in CABE that the importance of teacher and teacher Education in the society and also the use of ICT in Education. It was also proposed that a Credit Guarantee Fund should be set up, to facilitate larger numbers of students to gain access to higher Education. HRM also highlighted the usage of ICT in Education and appreciated the job done by the CABE Committee on ICT in School Education (Sibal, 2012).

The State Government of Jammu and Kashmir fails to utilize these funds for the whole Education Department. There was an unspent amount of Rs 11 crores lying in the State Bank of India which the State Government of Jammu and Kashmir has not withdrawn for strange reasons. With the result of that, the Ministry has asked the National Literacy Mission Authority to divert the funds to the north eastern states of the country (Muzaffar, 2012).

The result clearly depicts that that the ICT items like LCD Projector, Slide-Projector, Film-Projector, Epidiascope, and On-line-teaching/learning, Smart-board, Audio-Cassette and Video-Conference by which the teaching learning process can become effective and interesting were not available in the schools. It has been

observed from the result that these items were not available in Government as well as Private schools, the reason was that these advanced ICT items are expensive and these Schools might not afford to have these expensive items and these were deficient in all HSS. "It is divorced from realities of the school and suffers from lack of financial assistance" (Gupta and Kapoor 2013).

The government as well as private schools could take necessary measures which need to be placed, to ensure the adequate ICT in all schools. The government must improve the information technology as the educational sector for manpower performance and skill acquisition (Nelson, 2010).

## Section II

**4.2 Objective No.2: To find out the level of ICT Usage by the Students of Higher Secondary Schools.**

In order to study the level of ICT Usage by the students in Higher Secondary Schools, the main objective of the study was sub divided into following objectives with null hypothesis as framed below:

### 4.2.1 To find out the level of ICT Usage by the Students of Government Higher Secondary Schools (GHSS).

For achieving this objective the Descriptive Statistics (Mean and SD) were used.

Table. 4.2.1(i) depicted that all the Government Higher Secondary School Students used the ICT items like Film, Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Chart and Calculator fully, as their mean was greater than or equal to the assumed mean (degree of middle response score=2). The Usage of the items like Computer, Internet, Projector, LCD Projector, Slide-Projector, Film-Projector, Epidiascope, Video-Cassette, On-line teaching/learning, Smart-board, CD-Player, DVD-Player, CD/DVD, Audio-Conference and Video-Conference, Loud-Speaker, T.V and Radio were insufficiently used by the students, as their mean was less than the assumed mean(2).

## Table 4.2.1 (i)

***Usage of ICT by the Students in Government Higher Secondary Schools***

***(N=225)***

| S. no. of the items | Number of Students | Mean | S.D |
|---|---|---|---|
| 1 | 225 | 1.26 | .47 |
| 2 | 225 | 1.06 | .23 |
| 3 | 225 | 1.01 | .11 |
| 4 | 225 | 1.10 | .39 |
| 5 | 225 | 1.08 | .33 |
| 6 | 225 | 1.93 | .79 |
| 7 | 225 | 1.17 | .40 |
| 8 | 225 | 1.06 | .28 |
| 9 | 225 | 2.02 | .13 |
| 10 | 225 | 2.02 | .13 |
| 11 | 225 | 1.06 | .23 |
| 12 | 225 | 1.06 | .23 |
| 13 | 225 | 2.89 | .30 |
| 14 | 225 | 1.01 | .11 |
| 15 | 225 | 2.02 | .13 |
| 16 | 225 | 1.06 | .23 |
| 17 | 225 | 1.06 | .23 |
| 18 | 225 | 1.06 | .23 |
| 19 | 225 | 1.04 | .217 |
| 20 | 225 | 1.31 | .17 |
| 21 | 225 | 1.97 | .14 |
| 22 | 225 | 1.06 | .23 |
| 23 | 225 | 1.06 | .23 |
| 24 | 225 | 2.97 | .16 |
| 25 | 225 | 2.02 | .13 |

***Hypothesis 1*** *There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Government Higher Secondary Schools.*

The inferential statistics, t-test for one-sample, (sample mean and assumed mean =50) were used to know the level of using ICT. Where, assumed mean = degree of middle response score × total number of items (2×25=50).

**Table 4.2.1. (ii)**

***Result of t-test for one sample***

| | N | Real Mean | Test Value (Assumed Mean) | SD | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| GHSS | 225 | 35.68 | 50 | 2.48 | 224 | 86.62 | 0.000 |

Table 4.2.1(ii) clearly represents that the t-value (86.62) is significant at (0.05) level which confirms the rejection of the null hypothesis, '*there is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Government Higher Secondary Schools*'. The result revealed less Usage of ICT by the Government Higher Secondary School (GHSS) Students, because the real mean (35.68) was lower than the assumed mean (50).

**4.2.1.1 To find out the level of ICT Usage by the Students of Government Boys Higher Secondary Schools (GBHSS).**

For attainment of the above objective the Descriptive Statistics (Mean and SD) has been used.

Table 4.2.1.1 (i) revealed that all the Government Boys Higher Secondary School Students used the ICT items like Film, Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Loud-Speaker, Chart and Calculator fully, as their mean was greater than or equal to the assumed mean (degree of middle response score =2). The items like Computer, Internet, Projector, LCD Projector, Slide Projector, Film-Projector, Epidiascope, Video-Cassette, On-line teaching/learning, Smart-board, CD-Player, DVD-Player, CD/DVD, Audio-Conference, Video-Conference, T.V and

Radio were insufficiently used by the students as their mean was less than the assumed mean(2).

## Table 4.2.1.1 (i)

***Usage of ICT by the Students in Government Boys Higher Secondary Schools (N=15)***

| S. no. of the items | Number of Students | Mean | S.D |
|---|---|---|---|
| 1 | 15 | 1.67 | .62 |
| 2 | 15 | 1.20 | .41 |
| 3 | 15 | 1.13 | .35 |
| 4 | 15 | 1.20 | .41 |
| 5 | 15 | 1.13 | .35 |
| 6 | 15 | 2.60 | .50 |
| 7 | 15 | 1.20 | .41 |
| 8 | 15 | 1.13 | .35 |
| 9 | 15 | 2.26 | .46 |
| 10 | 15 | 2.26 | .46 |
| 11 | 15 | 1.20 | .41 |
| 12 | 15 | 1.13 | .35 |
| 13 | 15 | 2.93 | .25 |
| 14 | 15 | 1.13 | .35 |
| 15 | 15 | 2.26 | .45 |
| 16 | 15 | 1.20 | .41 |
| 17 | 15 | 1.20 | .41 |
| 18 | 15 | 1.20 | .41 |
| 19 | 15 | 1.13 | .35 |
| 20 | 15 | 1.13 | .35 |
| 21 | 15 | 2.06 | .25 |
| 22 | 15 | 1.20 | .41 |
| 23 | 15 | 1.20 | .41 |
| 24 | 15 | 2.93 | .25 |
| 25 | 15 | 2.26 | .45 |

**Hypothesis 1.1** *There is a medium level of ICT usage by the students of Government Boys Higher Secondary Schools.*

To know the level of using ICT in Government Higher Secondary Schools the inferential statistics test Kolmogorov Smirnov "Z" has been used.

**Table 4.2.1.1 (ii)**

***Result of Kolmogorov-Smirnov test for one-sample***

| GBHSS | N | Mean | SD | Most Extreme Absolute | Differences | | Z | Sig. |
|---|---|---|---|---|---|---|---|---|
| | | | | | Positive | Negative | | |
| | 15 | 38.86 | 4.99 | 0.312 | 0.312 | -0.220 | 1.209 | 0.107 |

Table 4.2.1.1 (ii) clearly depicts that the Z value (Kolmogorov-Smirnov) is (1.209) which is not significant at (0.05) level. The mean of ICT usage is (38.86) which is less than the assumed mean =50 (where, assumed mean = degree of middle response score × total number of items). This shows that the students are using the ICT items in medium level, therefore the hypothesis, *'there is a medium level of ICT usage by the students of Government Boys Higher Secondary Schools'* stands accepted.

**4.2.1.2 To find out the level of ICT Usage by the Students of Government Girls Higher Secondary Schools (GGHSS).**

For attainment of this objective Descriptive Statistics (Mean and SD) were used.

Table 4.2.1.2 (i) confirms that in all the Government Girls Higher Secondary School, the items like Film, Blackboard, Whiteboard, Chart and Calculator were fully used by the students as their mean was greater than or equal to the assumed mean (degree of middle response score=2). The items like Computer, Internet, Projector, LCD Projector, Slide Projector, Film-Projector, Tape-recorder, Epidiascope, Audio-Cassette, Video-Cassette, On-line teaching/learning, Smart-board, CD-Player, DVD-Player, CD/DVD, Audio-Conference, Video-Conference, Loud-Speaker, T.V and

Radio were inadequately used by the students, as their mean was less than the assumed mean (2).

## Table 4.2.1.2 (i)

***Usage of ICT by the Students in Government Girls Higher Secondary Schools (N=40)***

| S. no. of the items | Number of Students | Mean | S.D |
|---|---|---|---|
| 1 | 40 | 1.32 | .52 |
| 2 | 40 | 1.07 | .26 |
| 3 | 40 | 1.02 | .15 |
| 4 | 40 | 1.15 | .42 |
| 5 | 40 | 1.07 | .26 |
| 6 | 40 | 2.60 | .49 |
| 7 | 40 | 1.07 | .26 |
| 8 | 40 | 1.10 | .30 |
| 9 | 40 | 1.90 | .30 |
| 10 | 40 | 1.97 | .27 |
| 11 | 40 | 1.07 | .26 |
| 12 | 40 | 1.10 | .30 |
| 13 | 40 | 2.92 | .26 |
| 14 | 40 | 1.07 | .26 |
| 15 | 40 | 2.02 | .27 |
| 16 | 40 | 1.07 | .26 |
| 17 | 40 | 1.07 | .26 |
| 18 | 40 | 1.07 | .26 |
| 19 | 40 | 1.10 | .37 |
| 20 | 40 | 1.12 | .40 |
| 21 | 40 | 1.92 | .26 |
| 22 | 40 | 1.07 | .26 |
| 23 | 40 | 1.07 | .26 |
| 24 | 40 | 2.82 | .54 |
| 25 | 40 | 2.00 | .22 |

***Hypothesis 1.2*** *There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Government Girls Higher Secondary Schools*

To know the level of using ICT by the students of GGHSS, the inferential statistics t-test for one-sample has been used. Where, assumed mean = degree of middle response score × total number of items (2×25=50).

**Table 4.2.1.2 (ii)**

***Result of t-test for one sample***

| GGHSS | N | Real Mean | Test Value (Assumed Mean) | SD | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| | 40 | 36.47 | 50 | 2.5 | 39 | 34.2 | 0.000 |

Result given in table 4.2.1.2 (ii) shows that there was less usage of ICT by the Government Girls Higher Secondary School Students, as the real mean (36.47) was lower than the assumed mean (50) and the t-value (34.2) is significant at (0.05) level. This confirms rejection of null hypothesis, *'there is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Government Girls Higher Secondary Schools'*.

**4.2.1.3 To find out the level of ICT Usage by the Student in the Government Co-Educational Higher Secondary Schools (G (Co-Ed.) HSS).**

For achieving the above objective the Descriptive Statistics (Mean and SD) were used.

Table 4.2.1.3 (i) showed that in all the Government Co-Educational Higher Secondary Schools, the items like Film, Computer, Internet, Projector, LCD Projector, Slide Projector, Film-Projector, Epidiascope, Video-Cassette, On-line teaching/learning, Smart-board, CD-Player, DVD-Player, CD/DVD, Audio-Conference, Video-Conference, T.V and Radio were used inadequately, as their mean was less than the assumed mean (degree of middle response score=2). On the other hand, the other items like Tape-recorder, Audio-Cassette, Blackboard,

Whiteboard. Loud-Speaker, Chart and Calculator were fully used by the students as their mean was greater than or equal to the assumed mean (2).

## Table 4.2.1.3 (i)

***Usage of ICT by the Students in Government Co-Educational Higher Secondary Schools (N=170)***

| S. no. of the items | Number of Students | Mean | S.D |
|---|---|---|---|
| 1 | 170 | 1.21 | .42 |
| 2 | 170 | 1.04 | .19 |
| 3 | 170 | 1.01 | .13 |
| 4 | 170 | 1.02 | .15 |
| 5 | 170 | 1.02 | .16 |
| 6 | 170 | 1.72 | .75 |
| 7 | 170 | 1.02 | .15 |
| 8 | 170 | 1.04 | .25 |
| 9 | 170 | 2.01 | .15 |
| 10 | 170 | 2.02 | .13 |
| 11 | 170 | 1.08 | .29 |
| 12 | 170 | 1.02 | .15 |
| 13 | 170 | 2.89 | .44 |
| 14 | 170 | 1.02 | .16 |
| 15 | 170 | 2.01 | .17 |
| 16 | 170 | 1.04 | .19 |
| 17 | 170 | 1.04 | .19 |
| 18 | 170 | 1.04 | .19 |
| 19 | 170 | 1.01 | .13 |
| 20 | 170 | 1.02 | .16 |
| 21 | 170 | 2.00 | .15 |
| 22 | 170 | 1.08 | .35 |
| 23 | 170 | 1.04 | .22 |
| 24 | 170 | 2.94 | .29 |
| 25 | 170 | 2.02 | .18 |

***Hypothesis 1.3*** *There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Government Co-Educational. Higher Secondary Schools.*

The inferential statistics, t-test for one-sample was used to know the level of ICT Usage by the students of G (Co-Ed.) HSS. Where, assumed mean = degree of middle response score × total number of items (2×25=50).

**Table 4.2.1.3 (ii)**

***Result of t-test for one sample***

| G(Co-Ed.)HSS | N | Real Mean | Test Value (Assumed Mean) | SD | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| | 170 | 35.21 | 50 | 1.83 | 169 | 105.04 | 0.000 |

Table 4.2.1.3 (ii) shows that the t-value (105.04) is significant at (0.05) level. The result revealed less usage of ICT by the Government Co-Educational Higher Secondary School Students, because the real mean (35.21) is lower than the assumed mean (50). This confirms the rejection of null hypothesis *'there is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Government Co-Educational Higher Secondary Schools'*.

**4.2.2: To find out the level of ICT Usage by the Students of Private Higher Secondary Schools (PHSS).**

For attainment of above objective the Descriptive Statistics (Mean and SD) were used.

Table 4.2.2 (i) depicts that in all the Private Higher Secondary Schools, the ICT items like Computer, Film, Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Loud-Speaker, Chart and Calculator were fully used by the students, as their mean was greater than or equal to the assumed mean (degree of middle response score=2). The Usage of the items like Internet, Projector, LCD Projector, Slide-Projector, Film-Projector, Epidiascope, Video-Cassette, On-line teaching/learning, Smart-board, CD-Player, DVD-Player, CD/DVD, Audio-Conference, Video-

Conference, T.V and Radio were not in adequate use, as their mean was less than the assumed mean (2).

**Table 4.2.2 (i)**

***Usage of ICT by the Students in Private Higher Secondary Schools***

***(N=40)***

| S. no. of the items | Number of students | Mean | S.D |
|---|---|---|---|
| 1 | 40 | 2.35 | .48 |
| 2 | 40 | 1.95 | .84 |
| 3 | 40 | 1.30 | .55 |
| 4 | 40 | 1.07 | .26 |
| 5 | 40 | 1.12 | .40 |
| 6 | 40 | 2.67 | .61 |
| 7 | 40 | 1.05 | .22 |
| 8 | 40 | 1.12 | .46 |
| 9 | 40 | 2.50 | .50 |
| 10 | 40 | 2.50 | .50 |
| 11 | 40 | 1.95 | .84 |
| 12 | 40 | 1.15 | .48 |
| 13 | 40 | 2.92 | .34 |
| 14 | 40 | 1.15 | .48 |
| 15 | 40 | 2.50 | .50 |
| 16 | 40 | 1.95 | .84 |
| 17 | 40 | 1.95 | .84 |
| 18 | 40 | 1.95 | .84 |
| 19 | 40 | 1.07 | .34 |
| 20 | 40 | 1.12 | .46 |
| 21 | 40 | 2.07 | .26 |
| 22 | 40 | 1.95 | .84 |
| 23 | 40 | 1.95 | .84 |
| 24 | 40 | 2.90 | .30 |
| 25 | 40 | 2.40 | .50 |

***Hypothesis 2*** *There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Private Higher Secondary Schools.*

To know the level of using ICT in PHSS inferential statistics t-test for one-sample, (sample mean and assumed mean) has been used to know the level of using ICT. Where, assumed mean = degree of middle response score × total number of items (2×25=50).

**Table 4.2.2 (ii)**

***Result of t-test for one sample***

| PHSS | N | Real Mean | Test Value (Assumed Mean) | SD | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| | 40 | 46.1 | 50 | 8.66 | 39 | 2.84 | 0.007 |

Table 4.2.2 (ii) clearly depicts that the t-value(2.84) is significant at (0.05) level and the real mean (46.1) was lower than the assumed mean =50 (where, assumed mean = degree of middle response score × total number of items). Thus the null hypothesis *'there is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Private Higher Secondary Schools'* stands rejected

**4.2.2.1 To find out the level of ICT Usage by the Students of Private Boys Higher Secondary Schools (PBHSS)**

For attainment of the above objective the Descriptive Statistics (Mean and SD) were used.

Table 4.2.2.1 (i) reveals that in all the Private Boys Higher Secondary Schools, the items like Projector, LCD Projector, Slide Projector, Film-Projector, Epidiascope, On-line teaching/learning, Smart-board, Audio-Conference, Video-Conference and Loud-Speaker were inadequately used by the students, as their mean was less than the assumed mean (degree of middle response score=2).The other items like Computer, Internet, Film, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, CD-Player, DVD-Player, CD/DVD, T.V, Radio, Chart and Calculator

were fully used by the students as their mean was greater than or equal to the assumed mean (2).

## Table 4.2.2.1 (i)

***Usage of ICT by the Students in Private Boys Higher Secondary Schools (N=5)***

| S. no. of the items | Number of Students | Mean | S.D |
|---|---|---|---|
| 1 | 5 | 2.60 | .55 |
| 2 | 5 | 2.60 | .55 |
| 3 | 5 | 1.40 | .54 |
| 4 | 5 | 1.20 | .44 |
| 5 | 5 | 1.20 | .44 |
| 6 | 5 | 2.80 | .45 |
| 7 | 5 | 1.20 | .44 |
| 8 | 5 | 1.20 | .44 |
| 9 | 5 | 2.80 | .45 |
| 10 | 5 | 2.80 | .45 |
| 11 | 5 | 2.60 | .55 |
| 12 | 5 | 1.20 | .44 |
| 13 | 5 | 2.60 | .89 |
| 14 | 5 | 1.40 | .90 |
| 15 | 5 | 2.60 | .89 |
| 16 | 5 | 2.60 | .55 |
| 17 | 5 | 2.60 | .55 |
| 18 | 5 | 2.60 | .55 |
| 19 | 5 | 1.20 | .44 |
| 20 | 5 | 1.20 | .44 |
| 21 | 5 | 1.80 | .44 |
| 22 | 5 | 2.60 | .55 |
| 23 | 5 | 2.60 | .55 |
| 24 | 5 | 2.80 | .44 |
| 25 | 5 | 2.40 | .90 |

**Hypothesis 2.1** *There is a medium level of ICT usage by the students of Private Boys Higher Secondary Schools.*

The inferential statistics Kolmogorov-Smirnov Test for one sample has been used to know the level of using ICT by the students. Where, assumed mean = degree of middle response score × total number of items (2×25=50).

**Table 4.2.2.1 (ii)**

***Result of Kolmogorov-Smirnov test for one Sample***

| PBHSS | N | Mean | SD | Most Extreme Absolute | Differences | | Z | Sig. |
|---|---|---|---|---|---|---|---|---|
| | | | | | Positive | Negative | | |
| | 5 | 53.2 | 4.76 | 0.322 | 0.262 | -0.322 | 0.719 | 0.679 |

Table 4.2.2.1 (ii) clearly depicts that the Z value (Kolmogorov-Smirnov) (0.719) is not significant at (0.05) level. The mean of ICT usage is (53.2) which exceeds the assumed mean =50 (where, assumed mean = degree of middle response score × total number of items). This shows that the students are using ICT in medium level, hence the hypothesis *'The students of Private Boys Higher Secondary Schools are using ICT in medium level'* stands accepted.

**4.2.2.2 To find out the level of ICT Usage by the Students of Private Girls Higher Secondary Schools (PGHSS).**

For achieving the above objective the Descriptive Statistics (Mean and SD) were used.

Table 4.2.2.2 (i) reveals that in all the Private Girls Higher Secondary Schools, the items like Projector, LCD Projector, Slide-Projector, Film-Projector, Epidiascope, On-line teaching/learning, Smart-board, Audio-Conference, and Video-Conference were inadequately used by the students, as their mean was less than the assumed mean (degree of middle response score=2).The other items like Computer, Internet, Film, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, CD-Player, DVD-Player, CD/DVD, Loud-Speaker T.V, Radio, Chart and Calculator were fully used by the students as their mean was greater than or equal to the assumed mean (2).

## Table 4.2.2.2 (i)

*Usage of ICT by the Students in Private Girls Higher Secondary Schools (N=5)*

| S. no. of the items | Number of Students | Mean | S.D |
|---|---|---|---|
| 1 | 5 | 2.40 | .55 |
| 2 | 5 | 2.40 | .55 |
| 3 | 5 | 1.40 | .54 |
| 4 | 5 | 1.20 | .44 |
| 5 | 5 | 1.20 | .44 |
| 6 | 5 | 2.80 | .44 |
| 7 | 5 | 1.20 | .44 |
| 8 | 5 | 1.20 | .44 |
| 9 | 5 | 2.60 | .89 |
| 10 | 5 | 2.80 | .44 |
| 11 | 5 | 2.40 | .55 |
| 12 | 5 | 1.40 | .89 |
| 13 | 5 | 2.60 | .89 |
| 14 | 5 | 1.20 | .44 |
| 15 | 5 | 2.80 | .44 |
| 16 | 5 | 2.20 | .83 |
| 17 | 5 | 2.40 | .55 |
| 18 | 5 | 2.40 | .55 |
| 19 | 5 | 1.20 | .44 |
| 20 | 5 | 1.20 | .44 |
| 21 | 5 | 2.20 | .44 |
| 22 | 5 | 2.40 | .55 |
| 23 | 5 | 2.40 | .55 |
| 24 | 5 | 2.80 | .44 |
| 25 | 5 | 2.80 | .44 |

**Hypothesis 2.2** *There is a medium level of ICT usage by the students of Private Girls Higher Secondary Schools.*

To know the level of using ICT by the students of PGHSS, inferential statistics Kolmogorov-Smirnov test for one sample were used.

## Table 4.2.2.2(ii)

***Result of Kolmogorov-Smirnov test for one Sample***

| PGHSS | N | Mean | SD | Most Extreme Absolute | Differences | | Z | Sig. |
|---|---|---|---|---|---|---|---|---|
| | | | | | Positive | Negative | | |
| | 5 | 51.6 | 4.92 | 0.367 | 0.367 | -0.263 | 0.82 | 0.510 |

Table 4.2.2.2 (ii) clearly shows that the Z value (Kolmogorov-Smirnov) (0.82) is not significant at (0.05) level. Therefore the hypothesis *'there is a medium level of ICT usage by the students of Private Girls Higher Secondary Schools'*, stand accepted. The mean of ICT usage is (51.6) which exceeds the assumed mean (50) ,this shows that the students are using ICT in medium level.

**4.2.2.3 To find out the level of ICT Usage by the Students of Private Co-Educational Higher Secondary Schools (P (Co-Ed.) HSS).**

For attainment of the above objective the Descriptive Statistics (Mean and SD) were used.

Table 4.2.2.3 (i) shows that in all the Private Co-Educational Higher Secondary Schools, the items like Internet, Projector, LCD Projector, Slide Projector, Film-Projector, Epidiascope, Video-Cassette, On-line teaching/learning, Smart-board, CD-Player, DVD-Player, CD/DVD, Audio-Conference, Video-Conference, T.V and Radio were insufficiently used by the students as their mean was less than the assumed mean (degree of middle response score=2).The other items like Computer, Film, Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Loud-Speaker, Chart

and Calculator were fully used by the students as their mean was greater than or equal to the assumed mean (2).

## Table 4.2.2.3 (i)

***Usage of ICT by the Students in Private Co-Educational Higher Secondary Schools (N=30)***

| S. no. of the items | Number of Students | Mean | S.D |
|---|---|---|---|
| 1 | 30 | 2.30 | .47 |
| 2 | 30 | 1.77 | .86 |
| 3 | 30 | 1.23 | .57 |
| 4 | 30 | 1.10 | .3 |
| 5 | 30 | 1.20 | .55 |
| 6 | 30 | 2.77 | .43 |
| 7 | 30 | 1.67 | .53 |
| 8 | 30 | 1.10 | .40 |
| 9 | 30 | 2.33 | .48 |
| 10 | 30 | 2.33 | .48 |
| 11 | 30 | 1.77 | .86 |
| 12 | 30 | 1.10 | .4 |
| 13 | 30 | 2.93 | .25 |
| 14 | 30 | 1.10 | .4 |
| 15 | 30 | 2.33 | .48 |
| 16 | 30 | 1.77 | .86 |
| 17 | 30 | 1.77 | .86 |
| 18 | 30 | 1.77 | .86 |
| 19 | 30 | 1.10 | .4 |
| 20 | 30 | 1.20 | .61 |
| 21 | 30 | 2.90 | .25 |
| 22 | 30 | 1.77 | .86 |
| 23 | 30 | 1.77 | .86 |
| 24 | 30 | 2.90 | .25 |
| 25 | 30 | 2.33 | .48 |

***Hypothesis 2.3*** *There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Private Co-Educational Higher Secondary Schools.*

The inferential statistics, t-test for one-sample, (sample mean and assumed mean) was used to know the level of using ICT by the students. Where, assumed mean = degree of middle response score × total number of items (2×25=50).

**Table 4.2.2.3 (ii)**

***Result of t-test for one sample***

| P(Co-Ed.)HSS | N | Real Mean | Test Value (Assumed Mean) | SD | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| | 30 | 44 | 50 | 8.71 | 29 | 3.77 | 0.001 |

Table 4.2.2.3 (ii) reveals that the t-value(3.77) is significant at (0.05) level. The result shows that the real mean (44) is lower than the assumed mean (50). This confirms the rejection of null hypothesis, *'there is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Private Co-Educational Higher Secondary Schools'.*

**4.2.3: To compare the level of ICT Usage between the Students of Government and Private Higher Secondary Schools.**

To know the difference in the level of using ICT between Government and Private HSS students, inferential statistics t-test (for two-samples) was used.

**Hypothesis 3:** *There is no significant difference between the Government and Private Higher Secondary School Students in the level of ICT usage.*

**Table 4.2.3**

***Result of t-test for two samples***

| SAMPLE | N | Mean | SD | df | t | Sig. |
|---|---|---|---|---|---|---|
| GHSS | 225 | 35.68 | 2.48 | 263 | 15 | 0.000 |
| PHSS | 40 | 46.1 | 8.66 | | | |

It is evident from table 4.2.3 that the t value (15) is significant at (0.05) level which confirms rejection of the null hypothesis, *'there is no significant difference between the Government and Private Higher secondary School students in the level of ICT usage'*. The result revealed the usage of ICT by the Private School students with (mean=46.10) is better as compared to Government Higher Secondary School Students with (mean= 35.68).

**4.2.3.1 To compare the level of ICT Usage between the Students of Government and Private Boys Higher Secondary Schools**

The inferential statistics, Mann-Whitney U test (for two-samples) is used to check the difference in the level of using ICT between the students of Government and Private Boys HSS.

**Hypothesis 3.1** *There is no significant difference between Government and Private Boys Higher Secondary School students in the level of ICT usage.*

**Table 4.2.3.1**

***Result of Mann-Whitney U Test for two-samples***

| GROUP | N | Mean Rank | Sum Rank | Mann-Whitney U | Wilcoxon W | Z | Sig. |
|---|---|---|---|---|---|---|---|
| GBHSS | 15 | 8.27 | 124 | 4 | 124 | 2.97 | 0.003 |
| PBHSS | 5 | 17.2 | 86 | | | | |

Table 4.2.3.1 clearly represents that the U value (Mann Whitney) (4) is significant at (0.05) level, so the null hypothesis, *'There is no significant difference between the Government and Private Boys Higher Secondary School Students in the level of ICT usage'* stand rejected. There is difference between the GBHSS and PBHSS in the level of using ICT as the PBHSS students are using ICT better than that of GBHSS students.

**4.2.3.2 To compare the level of ICT Usage between the Students of Government and Private Girls Higher Secondary Schools.**

To know the difference in level of using ICT by the students of Government and Private Girls HSS, inferential statistics, Mann-Whitney U test (for two-samples) was used.

**Hypothesis 3.2** *There is no significant difference between Government and Private Girls Higher Secondary School students in the level of ICT usage.*

**Table 4.2.3.2**

***Result of Mann-Whitney U Test for two-samples***

| GROUP | N | Mean Rank | Sum Rank | Mann-Whitney U | Wilcoxon W | Z | Sig. |
|---|---|---|---|---|---|---|---|
| GGHSS | 40 | 20.5 | 822 | 2 | 822 | 3.629 | 0.000 |
| PGHSS | 5 | 42.6 | 213 | | | | |

The table 4.2.3.2 clearly depicted that the U value (Mann Whitney) (2) is significant at (0.05)level, so the null hypothesis *'There is no significant difference between the Government and Private Girls Higher Secondary School Students in the level of ICT usage'* stand rejected. There is difference between the GGHSS and PGHSS in the level of using ICT as the PGHSS students were using ICT better than that of GGHSS students.

**4.2.3.3 To compare the level of ICT Usage by the Students of Government and Private Co-Educational Higher Secondary Schools.**

For achieving the above objective inferential statistics t-test (for two-sample) was used to know the level of difference in using ICT by the students of Government and Private Co-Educational HSS students.

**Hypothesis 3.3** *There is no significant difference between the Government Co-Ed. Higher Secondary Schools as compared to Private Co-Ed. Higher Secondary Schools in the level of ICT usage.*

**Table 4.2.3.3**

***Result of t-test for two samples***

| SAMPLE | N | Mean | SD | df | t | Sig. |
|---|---|---|---|---|---|---|
| G(Co-Ed.)HSS | 170 | 35.22 | 1.83 | 198 | 11.85 | 0.000 |
| P(Co-Ed.)HSS | 30 | 44.00 | 8.71 | | | |

From table 4.2.3.3 it is clear that the t-value (11.85) is significant at (0.05) level, which confirms rejection of null hypothesis, '*there is no significant difference between the Government and Private Co-Educational Higher Secondary Schools in the level of ICT usage by the students*'. The result reveal the level of ICT usage by the Private School students (mean=44.00) is better as compared to Government Higher Secondary School students (mean= 35.22).

## Discussion:

**4.2: Objective No.2: To find out the level of ICT Usage by the Students of Higher Secondary Schools.**

Analysis of the data rejected the hypothesis that there is no significant difference between the real mean and the assumed mean in the level of ICT usage by the students of Government Higher Secondary School. Findings revealed that the levels of using ICT by all the Government School students such as GBHSS, GGHSS

and G (Co-Ed.) HSS were low, as the difference was observed between their real mean and assumed mean. The ICT items like LCD Projector, Slide-Projector, Epidiascope, On-line teaching/learning, Smart-board, Audio-Conference and Video-Conference were not completely used by the students. This provides credence that these items were not available in the schools. The ICT items such as Film, Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Loud-Speaker, Chart and Calculator were used by the students, this provide the credibility that these items were available in the schools. And some of the ICT items such as Computer, Internet, Projector, Video-Cassette, CD-Player, DVD-Player, CD/DVD, T.V and Radio were used by the students of government higher secondary schools, as there real mean is a bit near or equal to the assumed mean, owed to the reason that the students do not have the good skills and motivation to use these ICT items in school and they get less support and help from their teachers. Many of the teachers did not plan for students' use of technology (Box 1999). To fulfill authentic tasks (editing a video, a multimedia application etc.) students needed special ICT-skills and motivation because they conducted these independently within several weeks, mainly during leisure time. The tasks were linked to school via the ICT teachers help and support. The tasks helped the students to develop expertise by providing an opportunity for sustained thinking over a longer period than typical school tasks, as proposed by The Cognition and Technology Group at Vanderbilt (1990). These activities were aimed at enculturation students into authentic ICT practices through activity and social interaction (Brown, Collins, & Duguid, 1989; Lave, 1997).

Analysis of the data rejected the hypothesis that there is no significant difference between the real mean and the assumed mean in the level of ICT usage by the students of Private Higher Secondary Schools. The findings revealed less usage of ICT by the students of these Schools, the grounds were the absence of ICT items. This trend is consistent with a previous study exhibiting similar outcomes (Rao, 1984) Absence of sufficient equipments and materials as the first and the foremost hindering factor for the effective use of audio-visual equipments and materials. One of the comparable findings (Adeyem & Olaley, 2010) the level of the provision of ICT equipments to secondary schools in was low.

Findings also revealed, the medium level of using ICT by the students of Private (Boys and Girls) Higher Secondary Schools, therefore the data analysis accepted the hypothesis that the students of Private Boys Higher Secondary Schools are using ICT in medium level, it has also been revealed by the result of analysis that the students of Private Girls Higher Secondary Schools were also using ICT in medium level hence the hypothesis stands accepted. The real mean of ICT usage by the students exceeds the assumed mean, which gave an idea that the students used ICT in medium level. It was only for the reason that the students have positive attitude towards the use of ICT. Similar observations were reported by Vandana & Tanvi (2007), Babila. (2010), Agymang & Dadzie (2010) and Ozgen & Bindak (2012) observed that the students have positive attitude towards ICT (computer, internet) and ICT helps them at their studies. On the other hand the result revealed that the students of Private Co-Ed. Higher Secondary Schools were not using ICT in medium level as the real mean was observed less than the assumed mean. There was the basis that students used ICT according to availability in the Schools and as per their requirement. Similar observation has been reported by Hussain & Safdar (2008). that for productive teaching-learning process teachers and students have to use information technologies according to their requirements and availability.

The world of education has been greatly affected by the advancements in ICT. It plays an important role in learning process. The use of ICT makes it possible for the students to acquire new ways of learning in the class room and it offers a huge benefit to the students. Finding of the present study revealed the level of ICT usage by Private Higher Secondary School Students were better as compared to Government Higher Secondary School Students. When the different school students such as (GBHSS with PBHSS students),(GGHSS with PGHSS students), (G(Co-Ed.)HSS with P(Co-Ed.)HSS students)were compared it was found that the level of ICT usage by all Private school students was better as compared to Government school students. The reason behind this was that most of the private school students get more attention for using the ICT in the school as well as in their home as they belong to the rich and well educated families, while as the Government school students didn't get attention either in school or in home. Most of the students who read in government schools belong to

the poor families; they can't afford to go in Private schools because they cannot excise high charges as fees in these schools. The reason of better level of using ICT by PHSS students was because the Private schools were having good availability of infrastructures as compared to Government schools. But ICT hi-tech items such as LCD Projector, Slide-Projector, Epidiascope, On-line teaching/learning, Smart-board, Audio-Conference and Video-Conference were not been used by the students of both the schools either Government or Private school students with different school type. Parhar (1994) stated that "out of surveyed 20 schools only 4 schools were using T.V program fully and Video and Audio Cassette were not used in schools" This also revealed the low usage of ICT in schools.

Thus, the successful use of ICT items in the educational system may very much be related to and dependent upon the level of its usage. Effective learning and approaches of learning cannot be separated from the usage of technology. So the students of the digital age needs to take an approach that is relatively open , to seek, to inspire, support and facilitate learning to create an environment favorable to learning in schools. There was need to balance between using ICT items for learning and to bring effectiveness in it. This will be possible only when the State Government (who runs the GHSS) and management (who runs the PHSS) work for the benefit and benevolence of the students.

## Section III

### 4.3 Objective No.3: To find out the level of ICT Usage by the Teachers of Higher Secondary Schools

In order to study the Usage of ICT by the teachers in the Higher Secondary Schools, the main objective of the study was sub divided into following objectives with null hypothesis as described below:

### 4.3.1 To find out level of ICT Usage by the Teachers of Government Higher Secondary Schools (GHSS).

For achieving this objective the Descriptive Statistics (Mean and SD) were used.

Table 4.3.1(i) depicts that in all the Government Higher Secondary Schools, the ICT items like Film, Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Loud-Speaker, Chart and Calculator were fully used by the teachers, as their mean was greater than or equal to the assumed mean (degree of middle response score=2). The items like Computer, Internet, Projector, LCD Projector, Slide-Projector, Film-Projector, Epidiascope, Video-Cassette, On-line teaching/learning, Smart-board, CD-Player, DVD-Player, CD/DVD, Audio-Conference, Video-Conference, T.V and Radio were insufficiently used by the teachers, as their mean was less than the assumed mean(2).

## Table 4.3.1 (i)

***Usage of ICT by the Teachers in Government Higher Secondary Schools***

**(N=392)**

| S. no. of the items | Number of Teachers | Mean | S.D |
|---|---|---|---|
| 1 | 392 | 1.30 | .51 |
| 2 | 392 | 1.07 | .26 |
| 3 | 392 | 1.02 | .15 |
| 4 | 392 | 1.02 | .15 |
| 5 | 392 | 1.01 | .12 |
| 6 | 392 | 2.08 | .78 |
| 7 | 392 | 1.01 | .12 |
| 8 | 392 | 1.02 | .15 |
| 9 | 392 | 2.02 | .14 |
| 10 | 392 | 2.02 | .14 |
| 11 | 392 | 1.07 | .26 |
| 12 | 392 | 1.01 | .1 |
| 13 | 392 | 2.98 | .15 |
| 14 | 392 | 1.01 | .17 |
| 15 | 392 | 2.02 | .14 |
| 16 | 392 | 1.07 | .26 |
| 17 | 392 | 1.07 | .26 |
| 18 | 392 | 1.07 | .26 |
| 19 | 392 | 1.02 | .15 |
| 20 | 392 | 1.02 | .17 |
| 21 | 392 | 2.02 | .14 |
| 22 | 392 | 1.07 | .26 |
| 23 | 392 | 1.07 | .26 |
| 24 | 392 | 2.99 | .07 |
| 25 | 392 | 2.02 | .14 |

***Hypothesis 4*** *There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Higher Secondary Schools.*

The inferential statistics, t-test for one-sample, (sample mean and assumed mean =50) were used to know the level of using ICT. Where, assumed mean = degree of middle response score × total number of items (2×25=50).

**Table 4.3.1. (ii)**

***Result of t-test for one sample***

| GHSS | N | Real Mean | Test Value (Assumed Mean) | SD | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| | 392 | 35.97 | 50 | 2.69 | 391 | 102.93 | 0.000 |

Table 4.3.1(ii) clearly represents that the t-value (102.93) is significant at (0.05) level which confirms the rejection of the null hypothesis, '*there is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Higher Secondary Schools*'. The result revealed less Usage of ICT by the Government Higher Secondary School (GHSS) Teachers, because the real mean (35.97) is lower than the assumed mean (50).

**4.3.1.1 To find out the level of ICT Usage by the Teachers of Government Boys Higher Secondary Schools(GBHSS).**

For attainment of the above objective the Descriptive Statistics (Mean and SD) were used.

Table 4.3.1.1 reveals that all the Government Boys Higher Secondary School Teachers fully used the ICT items like Film, Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Chart and Calculator, as their mean was greater than or equal to the assumed mean (degree of middle response score=2). The items like Computer, Internet, Projector, LCD Projector, Slide-Projector, Film-Projector, Epidiascope, Video-Cassette, On-line teaching/learning, Smart-board, CD-Player, DVD-Player, CD/DVD, Audio-Conference, Video-Conference, Loud-Speaker, T.V

and Radio were insufficiently used by the teachers as their mean was less than the assumed mean(2).

**Table 4.3.1.1 (i)**

***Usage of ICT by the Teachers in Government Boys Higher Secondary Schools (N=26)***

| S. no. of the items | Number of Teachers | Mean | S.D |
|---|---|---|---|
| 1 | 26 | 1.81 | .69 |
| 2 | 26 | 1.23 | .43 |
| 3 | 26 | 1.15 | .37 |
| 4 | 26 | 1.11 | .32 |
| 5 | 26 | 1.07 | .27 |
| 6 | 26 | 2.57 | .50 |
| 7 | 26 | 1.11 | .32 |
| 8 | 26 | 1.11 | .32 |
| 9 | 26 | 2.31 | .47 |
| 10 | 26 | 2.31 | .47 |
| 11 | 26 | 1.23 | .43 |
| 12 | 26 | 1.11 | .32 |
| 13 | 26 | 2.88 | .32 |
| 14 | 26 | 1.11 | .32 |
| 15 | 26 | 2.31 | .47 |
| 16 | 26 | 1.23 | .43 |
| 17 | 26 | 1.23 | .43 |
| 18 | 26 | 1.23 | .43 |
| 19 | 26 | 1.11 | .32 |
| 20 | 26 | 1.11 | .32 |
| 21 | 26 | 1.92 | .27 |
| 22 | 26 | 1.23 | .43 |
| 23 | 26 | 1.23 | .43 |
| 24 | 26 | 2.92 | .27 |
| 25 | 26 | 2.31 | .47 |

**Hypothesis 4.1** *There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Boys Higher Secondary Schools.*

The inferential statistics, t-test for one-sample, (sample mean and assumed mean =50) were used to know the level of using ICT. Where, assumed mean = degree of middle response score × total number of items (2×25=50).

**Table 4.3.1.1 (ii)**
***Result of t-test for one sample***

| GBHSS | N | Real Mean | Test Value (Assumed Mean) | SD | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| | 26 | 39.38 | 50 | 5.076 | 25 | 10.66 | 0.000 |

Table 4.3.1.1 (ii) reveals that the t-value (10.66) is significant at (0.05) level. The result showed less usage of ICT by the Government Boys Higher Secondary School (GHSS) Teachers, because the real mean (39.38) was lower than the assumed mean (50). This confirms rejection of the null hypothesis *'there is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Boys Higher Secondary Schools'*.

**4.3.1.2 To find out the level of ICT Usage by the Teachers of Government Girls Higher Secondary Schools(GGHSS)**

For achieving this objective the Descriptive Statistics (Mean and SD) were used.

Table 4.3.1.2 (i) confirms that in all the Government Girls Higher Secondary Schools, the ICT items such as Computer, Internet, Projector, LCD Projector, Slide-Projector, Epidiascope, Film-Projector, On-line teaching/learning, Smart-board, Video-Cassette, CD-Player, DVD-Player, CD/DVD, Audio-Conference, Video-Conference, T.V, Radio and Calculator were inadequately used by the teachers, as their real mean was less than the assumed mean(degree of middle response score=2). The other items like Film, Tape-recorder, Audio-Cassette, Blackboard, Whiteboard,

Loud-Speaker, and Chart were fully used by the teachers, as their mean was greater than or equal to the assumed mean (2).

**Table 4.3.1.2 (i)**

***Usage of ICT by the Teachers in Government Girls Higher Secondary Schools***

***(N=75)***

| S. no. of the items | Number of Teachers | Mean | S.D |
|---|---|---|---|
| 1 | 75 | 1.36 | .56 |
| 2 | 75 | 1.12 | .33 |
| 3 | 75 | 1.04 | .19 |
| 4 | 75 | 1.04 | .19 |
| 5 | 75 | 1.02 | .16 |
| 6 | 75 | 2.57 | .49 |
| 7 | 75 | 1.05 | .23 |
| 8 | 75 | 1.04 | .19 |
| 9 | 75 | 2.02 | .16 |
| 10 | 75 | 2.01 | .11 |
| 11 | 75 | 1.12 | .33 |
| 12 | 75 | 1.04 | .25 |
| 13 | 75 | 2.96 | .19 |
| 14 | 75 | 1.05 | .28 |
| 15 | 75 | 2.00 | .16 |
| 16 | 75 | 1.12 | .33 |
| 17 | 75 | 1.12 | .33 |
| 18 | 75 | 1.12 | .33 |
| 19 | 75 | 1.05 | .28 |
| 20 | 75 | 1.05 | .28 |
| 21 | 75 | 2.02 | .16 |
| 22 | 75 | 1.13 | .34 |
| 23 | 75 | 1.13 | .34 |
| 24 | 75 | 2.97 | .16 |
| 25 | 75 | 1.97 | .16 |

***Hypothesis 4.2*** *There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Girls Higher Secondary Schools.*

To know the level of using ICT by the teachers of GGHSS the inferential statistics, t-test for one-sample has been used. Where, assumed mean = degree of middle response score × total number of items (2×25=50).

**Table 4.3.1.2 (ii)**

***Result of t-test for one sample***

| | N | Real Mean | Test Value (Assumed Mean) | SD | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| **GGHSS** | **75** | **36.81** | **50** | **3.03** | **74** | **37.63** | **0.000** |

Result given in Table 4.3.1.2 (ii) showed the there was less usage of ICT by the Government Girls Higher Secondary School Teachers, as the real mean (36.81) was lower than the assumed mean (50) and the t-value (37.63) is significant at (0.05) level. This confirms rejection of null hypothesis, *'there is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Girls Higher Secondary Schools'.*

**4.3.1.3 To find out the level of ICT Usage by the Teachers in the Government Co-Educational Higher Secondary Schools (G (Co-Ed.) HSS).**

For achieving this objective the Descriptive Statistics (Mean and SD) were used.

Table 4.3.1.3 (i) shows that in all the Government Co-Educational Higher Secondary School the ICT items such as Computer, Internet, Projector, LCD Projector, Slide-Projector, Film, Film-Projector, Epidiascope, Video-Cassette, On-line teaching/learning, Smart-board, Whiteboard, CD-Player, DVD-Player, CD/DVD, Audio-Conference and Video-Conference, T.V and Radio were used insufficiently by the teachers. The other items like Tape-recorder, Audio Cassette, Blackboard, Loud-

Speaker, Chart and Calculator were fully used by the teachers, as their mean was greater than or equal to the assumed mean (degree of middle response score=2).

## Table 4.3.1.3 (i)

***Usage of ICT by the Teachers in Government Co-Educational Higher Secondary Schools (N=291)***

| S. no. of the items | Number of Teachers | Mean | S.D |
|---|---|---|---|
| 1 | 291 | 1.23 | .45 |
| 2 | 291 | 1.04 | .21 |
| 3 | 291 | 1.03 | .19 |
| 4 | 291 | 1.02 | .18 |
| 5 | 291 | 1.02 | .23 |
| 6 | 291 | 1.90 | .78 |
| 7 | 291 | 1.01 | .16 |
| 8 | 291 | 1.01 | .14 |
| 9 | 291 | 2.00 | .12 |
| 10 | 291 | 2.00 | .12 |
| 11 | 291 | 1.04 | .21 |
| 12 | 291 | 1.01 | .14 |
| 13 | 291 | 2.94 | .3 |
| 14 | 291 | 1.02 | .18 |
| 15 | 291 | 1.90 | .13 |
| 16 | 291 | 1.04 | .21 |
| 17 | 291 | 1.06 | .26 |
| 18 | 291 | 1.06 | .27 |
| 19 | 291 | 1.02 | .2 |
| 20 | 291 | 1.03 | .25 |
| 21 | 291 | 2.00 | .12 |
| 22 | 291 | 1.04 | .21 |
| 23 | 291 | 1.04 | .21 |
| 24 | 291 | 2.98 | .13 |
| 25 | 291 | 2.00 | .12 |

***Hypothesis 4.3*** *There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Co-Educational Higher Secondary Schools.*

The inferential statistics, t-test for one-sample was used to know the level of using ICT in G (Co-Ed.) HSS. Where, assumed mean = degree of middle response score × total number of items (2×25=50).

**Table 4.3.1.3 (ii)**

***Result of t-test for one sample***

| | N | Real Mean | Test Value (Assumed Mean) | SD | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| G(Co-Ed.)HSS | 291 | 35.45 | 50 | 1.94 | 290 | 128.25 | 0.000 |

Table 4.3.1.3 (ii) shows that the t-value (128.25) is significant at (0.05) level. The result revealed less usage of ICT by the Government Co-Educational Higher Secondary School Teachers, because the real mean (35.45) is lower than the assumed mean (50). This confirms the rejection of null hypothesis *'there is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Co-Educational Higher Secondary Schools'*.

**4.3.2: To find out the level of ICT Usage by the Teachers of Private Higher Secondary Schools (PHSS).**

For attainment of above objective the Descriptive Statistics (Mean and SD) were used.

Table 4.3.2 (i) depicts that all the Private Higher Secondary School Teachers fully used the ICT items like Computer, Internet, Film, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, CD-Player, DVD-Player, CD/DVD, T.V, Radio, Chart and Calculator, as their mean was greater than or equal to the assumed mean (degree of middle response score=2)where as the Usage of the items like Projector, LCD Projector, Slide-Projector, Film-Projector, Epidiascope,

On-line teaching/learning, Smart-board, Audio-Conference, Video-Conference and Loud-Speaker was insufficient, as their mean was less than the assumed mean (2).

## Table 4.3.2 (i)

***Usage of ICT by the Teachers in Private Higher Secondary Schools***

***(N=70)***

| S. no. of the items | Number of Teachers | Mean | S.D |
|---|---|---|---|
| 1 | 70 | 2.40 | .49 |
| 2 | 70 | 2.08 | .81 |
| 3 | 70 | 1.31 | .58 |
| 4 | 70 | 1.05 | .23 |
| 5 | 70 | 1.04 | .2 |
| 6 | 70 | 2.88 | .32 |
| 7 | 70 | 1.05 | .29 |
| 8 | 70 | 1.04 | .2 |
| 9 | 70 | 2.57 | .49 |
| 10 | 70 | 2.57 | .49 |
| 11 | 70 | 2.08 | .81 |
| 12 | 70 | 1.05 | .23 |
| 13 | 70 | 2.94 | .29 |
| 14 | 70 | 1.07 | .35 |
| 15 | 70 | 2.57 | .49 |
| 16 | 70 | 2.08 | .81 |
| 17 | 70 | 2.08 | .81 |
| 18 | 70 | 2.08 | .81 |
| 19 | 70 | 1.05 | .23 |
| 20 | 70 | 1.04 | .2 |
| 21 | 70 | 1.97 | .17 |
| 22 | 70 | 2.08 | .81 |
| 23 | 70 | 2.08 | .81 |
| 24 | 70 | 2.95 | .2 |
| 25 | 70 | 2.54 | .5 |

***Hypothesis 5*** *There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Private Higher Secondary Schools.*

To know the level of using ICT in PHSS inferential statistics, t-test for one-sample, (sample mean and assumed mean) has been used to know the level of using ICT. Where, assumed mean = degree of middle response score × total number of items (2×25=50).

**Table 4.3.2. (ii)**

***Result of t-test for one sample***

| | N | Real Mean | Test Value (Assumed Mean) | SD | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| PHSS | 70 | 47.48 | 50 | 8.32 | 69 | 2.53 | 0.014 |

Table 4.3.2 (ii) clearly depicts that the t-value (2.53) is significant at (0.05) level and the real mean (47.48) was a bit lower than the assumed mean (50). Thus the null hypothesis *'there is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Private Higher Secondary Schools'* stands rejected

**4.3.2.1 To find out the level of Usage by the Teachers of Private Boys Higher Secondary Schools (PBHSS).**

For attainment of the above objective the Descriptive Statistics (Mean and SD) were used.

Table 4.3.2.1 (i) reveals that in all the Private Boys Higher Secondary Schools, teachers fully used the ICT items such as Computer, Internet, Film, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, CD-Player, DVD-Player, CD/DVD, Loud-Speaker, T.V, Radio, Chart and Calculator, as their mean was greater than or equal to the assumed mean (degree of middle response score=2) where as the Usage of the items like Projector, LCD Projector, Slide- Projector, Film-Projector,

Epidiascope, On-line teaching/learning, Smart-board, Audio-Conference and Video-Conference was insufficient, as their mean was less than the assumed mean (2).

## Table 4.3.2.1 (i)

***Usage of ICT by the Teachers in Private Boys Higher Secondary Schools***

***(N=10)***

| S. no. of the items | Number of Teachers | Mean | S.D |
|---|---|---|---|
| 1 | 10 | 2.60 | .52 |
| 2 | 10 | 2.60 | .52 |
| 3 | 10 | 1.40 | .52 |
| 4 | 10 | 1.30 | .67 |
| 5 | 10 | 1.20 | .42 |
| 6 | 10 | 2.80 | .42 |
| 7 | 10 | 1.10 | .31 |
| 8 | 10 | 1.30 | .67 |
| 9 | 10 | 2.70 | .67 |
| 10 | 10 | 2.70 | .48 |
| 11 | 10 | 2.50 | .52 |
| 12 | 10 | 1.20 | .42 |
| 13 | 10 | 2.80 | .42 |
| 14 | 10 | 1.20 | .42 |
| 15 | 10 | 2.70 | .67 |
| 16 | 10 | 2.60 | .52 |
| 17 | 10 | 2.60 | .52 |
| 18 | 10 | 2.60 | .52 |
| 19 | 10 | 1.20 | .42 |
| 20 | 10 | 1.30 | .67 |
| 21 | 10 | 2.20 | .42 |
| 22 | 10 | 2.70 | .48 |
| 23 | 10 | 2.60 | .51 |
| 24 | 10 | 2.80 | .42 |
| 25 | 10 | 2.80 | .42 |

***Hypothesis 5.1*** *There is a medium level of ICT usage by the teachers of Private Boys Higher Secondary Schools.*

To know the level of using ICT by the teachers of PGHSS, inferential statistics Kolmogorov-Smirnov Test for one sample were used.

**Table 4.3.2.1 (ii)**

***Result of Kolmogorov-Smirnov test for one Sample***

| | N | Mean | SD | Most Extreme Absolute | Differences | | Z | Sig. |
|---|---|---|---|---|---|---|---|---|
| PBHSS | | | | | Positive | Negative | | |
| | 10 | 53.2 | 4.49 | 0.33 | 0.276 | -0.333 | 1.05 | 0.216 |

Table 4.3.2.1 (ii) clearly depicts that the Z value (Kolmogorov-Smirnov) (1.05) is not significant at (0.05) level. The mean of ICT usage is (53.2) which exceeds the assumed mean =50 (where, assumed mean = degree of middle response score × total number of items). This shows that the teachers were using ICT in medium level, hence the hypothesis *'The teachers of Private Boys Higher Secondary Schools are using ICT in medium level'* stands accepted.

**4.3.2.2 To find out the level of ICT Usage by the Teachers of Private Girls Higher Secondary Schools (PGHSS).**

For achieving the above objective the Descriptive Statistics (Mean and SD) were used.

Table 4.3.2.2 (i) reveals in all the Private Girls Higher Secondary Schools, teachers inadequately used ICT items such as Projector, LCD Projector, Slide-Projector, Film-Projector, Epidiascope, On-line teaching/learning, Smart-board, Audio-Conference and Video-Conference, as their mean was less than the assumed mean(degree of middle response score=2). The other items like Computer, Internet, Film, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, CD-Player, DVD-Player, CD/DVD, Loud-Speaker, T.V, Radio, Chart and Calculator were fully used by them, as their mean was greater than or equal to the assumed mean (2).

## Table 4.3.2.2 (i)

**Usage of ICT by the Teachers in Private Girls Higher Secondary Schools**

**(N=5)**

| S. no. of the items | Number of Teachers | Mean | S.D |
|---|---|---|---|
| 1 | 10 | 2.40 | .52 |
| 2 | 10 | 2.40 | .52 |
| 3 | 10 | 1.40 | .52 |
| 4 | 10 | 1.10 | .31 |
| 5 | 10 | 1.20 | .63 |
| 6 | 10 | 2.80 | .42 |
| 7 | 10 | 1.20 | .42 |
| 8 | 10 | 1.10 | .31 |
| 9 | 10 | 2.80 | .42 |
| 10 | 10 | 2.80 | .42 |
| 11 | 10 | 2.40 | .52 |
| 12 | 10 | 1.10 | .31 |
| 13 | 10 | 2.80 | .42 |
| 14 | 10 | 1.20 | .42 |
| 15 | 10 | 2.80 | .42 |
| 16 | 10 | 2.40 | .52 |
| 17 | 10 | 2.40 | .52 |
| 18 | 10 | 2.40 | .52 |
| 19 | 10 | 1.20 | .42 |
| 20 | 10 | 1.20 | .42 |
| 21 | 10 | 2.10 | .32 |
| 22 | 10 | 2.30 | .67 |
| 23 | 10 | 2.40 | .52 |
| 24 | 10 | 2.80 | .63 |
| 25 | 10 | 2.70 | .67 |

***Hypothesis 5.2*** *There is a medium level of ICT usage by the teachers of Private Girls Higher Secondary Schools.*

To know the level of using ICT by the teachers of PGHSS, inferential statistics Kolmogorov-Smirnov Test for one sample was used.

**Table 4.3.2.2(ii)**

***Result of Kolmogorov-Smirnov test for one Sample***

| PGHSS | N | Mean | SD | Most Extreme Absolute | Differences | | Z | Sig. |
|---|---|---|---|---|---|---|---|---|
| | | | | | Positive | Negative | | |
| | 10 | 51.6 | 4.64 | 0.381 | 0.381 | -0.277 | 1.204 | 0.110 |

Table 4.3.2.2 (ii) clearly shows that the Z value (Kolmogorov-Smirnov) (1.204) is not significant at (0.05) level. Therefore the hypothesis '*there is a medium level of ICT usage by the teachers of Private Girls Higher Secondary Schools*', stand accepted. The mean of ICT usage is (51.6) which exceeds the assumed mean (50), this shows that the teachers are using ICT in medium level.

**4.3.2.3 To find out the level of ICT Usage by the Teachers of Private Co-Educational Higher Secondary Schools (P (Co-Ed.) HSS).**

For attainment of the above objective the Descriptive Statistics (Mean and SD) were used.

Table 4.3.2.3 (i) shows that in all the Private Co-Educational Higher Secondary Schools the ICT items like Internet, Projector, LCD Projector, Slide-Projector, Film-Projector, Epidiascope, Video-Cassette, On-line teaching/learning, Smart-board, CD-Player, DVD-Player, CD/DVD, Audio-Conference and Video-Conference, Loud-Speaker, T.V and Radio were insufficiently used by the teachers, as their mean was less than the assumed mean (degree of middle response score=2). The other items like Computer, Film, Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Chart and Calculator were fully used by them, as their mean was greater than or equal to the assumed mean (2).

## Table 4.3.2.3 (i)

*Usage of ICT by Teachers in Private Co-Educational Higher Secondary Schools*

*(N=50)*

| S. no. of the items | Number of Teachers | Mean | S.D |
|---|---|---|---|
| 1 | 50 | 2.36 | .48 |
| 2 | 50 | 1.92 | .85 |
| 3 | 50 | 1.28 | .61 |
| 4 | 50 | 1.06 | .23 |
| 5 | 50 | 1.08 | .34 |
| 6 | 50 | 2.82 | .39 |
| 7 | 50 | 1.06 | .24 |
| 8 | 50 | 1.06 | .24 |
| 9 | 50 | 2.40 | .49 |
| 10 | 50 | 2.40 | .49 |
| 11 | 50 | 1.92 | .85 |
| 12 | 50 | 1.10 | .41 |
| 13 | 50 | 2.90 | .19 |
| 14 | 50 | 1.06 | .24 |
| 15 | 50 | 2.40 | .49 |
| 16 | 50 | 1.94 | .84 |
| 17 | 50 | 1.92 | .85 |
| 18 | 50 | 1.92 | .85 |
| 19 | 50 | 1.06 | .24 |
| 20 | 50 | 1.08 | .39 |
| 21 | 50 | 1.96 | .19 |
| 22 | 50 | 1.94 | .84 |
| 23 | 50 | 1.94 | .84 |
| 24 | 50 | 2.96 | .19 |
| 25 | 50 | 2.42 | .49 |

***Hypothesis 5.3*** *There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Private Co-Educational Higher Secondary Schools.*

The inferential statistics, t-test for one-sample, (sample mean and assumed mean) was used to know the level of using ICT by the teachers.

**Table 4.3.2.3 (ii)**

***Result of t-test for one sample***

| P(Co-Ed.)HSS | N | Real Mean | Test Value (Assumed Mean) | SD | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| | 50 | 45.52 | 50 | 8.70 | 49 | 3.64 | 0.001 |

Table 4.3.2.3 (ii) reveals that the t-value (3.64) is significant at (0.05) level. The result showed that the real mean (45.52) is lower than the assumed mean (50). This confirms the rejection of null hypothesis, *'there is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Private Co-Educational Higher Secondary Schools'.*

**4.3.3: To compare the level of ICT usage between the Teachers of Government and Private Higher Secondary Schools.**

To know the difference in the level of using ICT between Government and Private HSS teachers, inferential statistics, t-test (for two-samples) was used.

***Hypothesis 6*** *There is no significant difference between the Government and Private Higher Secondary School Teachers in the level of ICT usage.*

**Table 4.3.3**

***Result of t-test for two samples***

| SAMPLE | N | Mean | SD | df | t | Sig. |
|---|---|---|---|---|---|---|
| GOVERNMENT | 392 | 35.97 | 2.698 | 460 | 21.79 | 0.000 |
| PRIVATE | 70 | 47.48 | 8.32 | | | |

It is evident from table 4.3.3 that the t value (21.79)is significant at (0.05) level which confirms rejection of the null hypothesis, *'there is no significant difference between the Government and Private Higher secondary School teachers in the level of ICT usage'*. The result reveals the usage of ICT by the Private School teachers with (mean=46.10) is better as compared to Government Higher Secondary School with (mean= 35.68).

**4.3.3.1 To compare the level of ICT usage between the Teachers of Government and Private Boys Higher Secondary Schools.**

To know the difference in level of using ICT by the teachers of Government and Private Boys HSS, inferential statistics, Mann-Whitney U test (for two-samples) was used.

***Hypothesis 6.1*** *There is no significant difference between Government and Private Boys Higher Secondary School Teachers in the level of ICT usage.*

**Table 4.3.3.1**

***Result of Mann-Whitney U Test for two-samples***

| GROUP | N | Mean Rank | Sum Rank | Mann-Whitney U | Wilcoxon W | Z | Sig. |
|---|---|---|---|---|---|---|---|
| GBHSS | 26 | 14.12 | 367.0 | 16 | 367.00 | 4.08 | 0.000 |
| PBHSS | 10 | 29.90 | 299.0 | | | | |

Table 4.3.3.1 clearly represented that the U value (Mann Whitney) (16) is significant at (0.05) level, so the null hypothesis *'There is no significant difference between the Government and Private Boys Higher Secondary School Teachers in the level of ICT usage'* stands rejected. There is difference between the GBHSS and PBHSS in the level of using ICT as the PBHSS teachers were using ICT better than that of GBHSS teachers.

**4.3.3.2 To compare the level of ICT usage between the Teachers of Government and Private Girls Higher Secondary Schools.**

To know the difference in level of using ICT by the teachers of Government and Private Girls HSS, inferential statistics, t-test (Mann-Whitney for two-samples) was used.

***Hypothesis 6.2*** *There is no significant difference between Government and Private Girls Higher Secondary School teachers in the level of ICT usage.*

**Table 4.3.3.2**

***Result of Mann-Whitney U Test for two-samples***

| GROUP | N | Mean Rank | Sum Rank | Mann-Whitney U | Wilcoxon W | Z | Sig. |
|---|---|---|---|---|---|---|---|
| GGHSS | 75 | 38.00 | 2856.0 | 6 | 2850.0 | 5.306 | 0.000 |
| PGHSS | 10 | 79.90 | 799.0 | | | | |

Table 4.3.3.2 clearly depicted that the Mann Whitney U value (6) is significant at (0.05) level, so the null hypothesis *'There is no significant difference between the Government and Private Boys Higher Secondary School Teachers in the level of ICT usage'* stands rejected. There is difference between the GGHSS and PGHSS in the level of using ICT as the PGHSS teachers were using ICT better than that of GGHSS teachers.

**4.3.3.3 To compare the level of ICT usage between the Teachers of Government and Private Co-Educational Higher Secondary Schools.**

For achieving the above objective inferential statistics, t-test (for two-samples) was used.

***Hypothesis 6.3*** *There is no significant difference between Government and Private Co-Educational Higher Secondary School teachers in the level of ICT usage.*

**Table 4.3.3.3**

***Result of t-test for two-samples.***

| SAMPLE | N | Mean | SD | df | t | Sig. |
|---|---|---|---|---|---|---|
| G(Co-Ed.)HSS | 291 | 35.45 | 1.93 | 339 | 17.48 | 0.000 |
| P(Co-Ed.)HSS | 50 | 45.52 | 8.7 | | | |

From table 4.3.3.3 it is evident that the t-value (17.48) is significant at (0.05) level, which confirms rejection of null hypothesis, '*there is no significant difference between the Government and Private Co-Ed. Higher Secondary Schools in the level of ICT usage by the teachers*'. The result revealed the level of ICT usage by the Private School teachers (mean=45.52) is better as compared to Government Higher Secondary School teachers (mean= 35.45).

## Discussion:

### 4.3: Objective No.3: To find out the level of ICT Usage by the Teachers of Higher Secondary Schools.

Teachers are the heart of education system; Teaching is becoming one of the most challenging professions in our society, where knowledge is expanding rapidly and modern technologies are demanding teachers to learn how to use these technologies in their teaching. Teacher has to play a key factor for improving the teaching process and it is possible only by the usage of ICT, as it is a great boon in the field of education. The teacher shoulders the responsibility to edify the students, if a teacher is ICT literate then only he can impart interesting and healthy education to the students. The usage of the ICT depends upon the competence and knack of teachers to keep pace with changing technology day by day.

The null hypothesis, that there is no significant difference between the real mean and the assumed mean in the level of ICT usage by the teachers of Government Higher Secondary School has been rejected after analyzing the data. Findings revealed that the level of using ICT by Government School teachers was low almost in all schools as the difference was observed between their real mean and assumed mean. In different type of Government schools such as, GBHSS, GGHSS and G (Co-Ed.) HSS, the ICT items like LCD Projector, Slide-Projector, Epidiascope, On-line teaching/learning, Smart-board, Audio-Conference and Video-Conference were exceptionally used less by the teachers. The basic problems found was lack of such items in the schools and majority of the teachers were not ready to imbibe ICT in their classrooms during the teaching process, this was reported by (Box 1999), in his study number of the teachers did not plan to use technology. The ICT items such as Film, Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Loud-Speaker, Chart and Calculator were used by the teachers, this endow dependability on the available ICT items in the schools. And some of the ICT items such as Computer, Internet, Projector, Video-Cassette, CD-Player, DVD-Player, CD/DVD, T.V and Radio were to some extent used by the teachers of government schools. The reason for using ICT partially gave confirmation to the fact that the teachers lack confidence while using ICT in the classrooms. Several studies (Nikolaus. 1985., Wiken & Molster.2011) have been reported that the teacher expressed lack of ICT confidence and in their ability to use computer in classrooms.

Analysis of the data rejected the hypothesis that there is no significant difference between the real mean and the assumed mean in the level of ICT usage by the teachers of Private Higher Secondary School. The findings revealed less usage of ICT by the teachers of Private Schools. The reason was not only the absence of ICT items but also the teachers were not persuaded for the utilization of ICT in the classrooms. (Kiridis, et al.2006) has reported that the majority of respondents believe that ICT was useful tool for teaching but they were not fully convinced about the advisability of immediate introduction of new technologies. Findings also revealed that there was medium level of using ICT by the teachers of Private (Boys and Girls) Higher Secondary Schools, therefore the data analysis accepted the hypothesis that the

teachers of Private Boys Higher Secondary Schools are using ICT in medium level, it has also been revealed by the result that the teachers of Private Girls Higher Secondary Schools were also using ICT in medium level hence the hypothesis stands accepted. The real mean of usage by the teachers exceeds the assumed mean, that showed the teachers used ICT in medium level. It is due to the verity that the teachers of Private (BHSS &GHSS) have positive attitude towards the use of ICT. Numerous studies opined that the teachers have positive attitude toward the ICT (Mosely & Higgins, 1999. Mathiasdottir, et al. 2003., Albirin, 2004) and some studies (Mc-Carthy,1998, Sadik, 2006.,Ogunkola 2008) found that the teachers have positive attitude towards the use of computer. The result also discovered that the teachers of Private Co-Educational Higher Secondary Schools were not using ICT in medium level as the real mean is less than the assumed mean. On the grounds that the teachers used ICT items according to availability and requirement in the classroom.

The use of ICT makes it possible for the teachers to acquire new ways of teaching in the class room learning. The usage of ICT offers a huge benefit to the teachers. Finding of the present study revealed the level of ICT usage by Private Higher Secondary School Teachers were better as compared to Government Higher Secondary School Teachers. After analyzing the data an attempt was made to compare the school teachers working in different schools such as (GBHSS with PBHSS teachers),(GGHSS with PGHSS teachers), (G(Co-Ed.)HSS with P(Co-Ed.)HSS teachers) and it was found that the level of ICT usage by all Private school teachers was better as compared to Government school teachers, the cause was that most of the Private school teachers had some sort of skills and training for using the ICT in the classrooms during the teaching and learning process where as the Government school teachers didn't have these ICT items in the schools that is why they are lagging behind the Private school teachers. Erkan (2003) found that the provision of training was seen as a key factor in both changing attitudes and encouraging teachers in incorporating technology into their instructions. Sadik (2006) found that the teachers who had long teaching experience were more likely to appreciate the importance of computer use in schooling. Most of the teachers who worked in government schools had lot of teaching experiences but were not aware of

new techniques and trends of using ICT in teaching process while as the private school teachers had not enough teaching experiences but they were fully trained about the usage of ICT items which were available in the schools, that is why private school teachers used ICT in a better manner than those working in government schools. Wiken & Molster (2011) found that to integrate ICT in one's own teaching is a difficult and gradual process and teachers must be given time to find their own way to merge ICT with their own teaching style. Gupta and Kapoor (2013) reported that the intuitions of J & K need to be revamped to produce professionally trained teachers, fully equipped with both high academic standards, pedagogical practical skill, ethical and moral values. In the back drop of the past, quality in teacher education has always been given top priority by the rulers of J&K state.

The result clearly depicted that the usage of ICT hi-tech items such as (LCD Projector, Slide-Projector, Epidiascope, On-line teaching/learning, Smart-board, Audio-Conference and Video-Conference) were low as the teachers of both schools either Government or Private were not using these ICTs. The reason was only the unavailability of such items in the schools. Gupta and Kapoor (2013) reported that these Higher Secondary Schools were less equipped, less financed, and were lacking the learning assets. In order to make these institutions a center of excellence, requirement arises to equip these schools or institutions with ample infrastructure and newest technology, and knowledge resources. Teacher educators working in these institutions should be given incentives for home library, lap-top and study tours. The best teacher educators in these institutions should be picked up by state for both the national and the international awards.

## REFERENCES

Adenyemi, T. O., & Olaleye, F. O. (2010). Information and Communication Technology ICT for effective management of secondary schools for sustainable development in Ekiti state, Nigeria. *American Eurasian Journal of Scientific research, 5*(2), 106-113. IDOSI Publications.

Agyemang, B. K., & Dadzie, P. (2010). Providing Information Communication Technology Support to distance education students, in university of Ghana,Legon. *Turkish Journal of distance Education TOJDE, 11*(3). ISSN 1302-6488.

Albirini, A. (2004). *An Exploration of the factors associated with the attitudes of high school EFL, teachers in Syria toward Information and Communication Technology.* Doctoral dissertation, Ohio state University, Ohio.

Babila, M. T. (2010). The impact of ICT on students study habits. Case study: University of Buea, Cameroon. *Journal of Science and Technology Education Research, 1*(5), 107–110. Retrieved from http://www.academicjournals.org/JSTER

Box, K. (1999). *A snapshot of Texas high school.* Denton, TX: Texas Center for Educational Technology. Retrieved from http://www.tcet.unt.Ed./research/techrept/snapl.htm

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32–42.

De Vos, A. S. (1998). *Research at grass roots.* S.A: J. L.VanSchaik.

Erkan, A. (2003). *Teachers' attitudes toward computer technology use in vocabulary instruction.* Unpublished doctoral dissertation, Bilkent University, Ankara.

Govinda, R. (2002). *India Education Report: A Profile of Basic Education.* (NIEPA) (UNESCO) New Delhi: Oxford University Press.

Gupta, A. K., & Kapoor, D. R. (2013). www.aiaer.net, www.google.com/url?q=http://www.aiaer.net/ejournal/vol19207/29._gupta kapoor.htm&sa. Retrieved from 21 March, 2013.

Hussain, I. & Safdar, M. (2008). Role of information technologies in teaching learning process. *Perception of TOJDE, 9*(2). ISSN 1302-6488.

ICT in School Education (2010). *Information and Communication Technology for education in India and South Asia, Essay II, ICT in school education (Primary and Secondary),* by Info dev and Price White Coopers (PWC). Retrieved from *infoDev-www.infodev.org/en/Document.1016.pdf*

India Education Report (2002). *A profile of Basic Education*(edited by R. Govinda) National Institute of Educational planning and Administration (UNESCO).Oxford University Press.

Kiridis, A., Dorros, V., & Tsakiridou, E. (2006). Teachers facing information and communication technology (ICT): The case of Greece. *Journal of Technology and Teacher Education 14*(1), 75-96.

Lave, J. (1997). The culture of acquisition and the practice of understanding. In D. Kirshner, & J. Whitson (Eds.), *Situated cognition. Social, semiotic, and psychological perspectives*. Mahwah, NJ: Erlbaum.

Mathiasdottir, A., Dal, M., & Lefevr S. C. (2003, June). How do teachers use Information and Communication Technology in Icelandic high schools in 2002? *Proceedings of the 4th International conference on computer system and technologies e-learning,* p.562-567, , Rousse, Bulgaria.

McCarthy, P. J. (1998). Teacher attitude toward computers and the relationship between attitudes toward computers and the level of involvement with computers among New York City special Education teachers. Unpublished doctoral dissertation, Columbia University Teachers College, New York, DAI59/01A, p.133.

Moseley, D., & Higgins, S. (1999). Ways forward with ICT: Effective pedagogy using Information and Communication Technology for literacy and numeracy IN primary schools. University of Newcastle. London: Teacher Training Agency.

Muzaffar, I. (2012). *Govt. Fails To Utilize Funds; Education Dept In Slumber "SAKSHAR BHARAT MISSION IMPOSSIBLE"* Greater Kashmir (Last update on Monday,12 Nov 2012 (00:00:00 IST)).

Nelson, O. (2010*). ICT and the educational performance: The inter-relationship of selected critical variables in Covenant University College of Human Development Covenant University, Ogun State, Nigeria.* Jan 10, article 03. Retrieved from http://www.itdl.org/journal/May_10/article03.htm

Nikolaus, K. A. (1985). A study of the attitude of Tennessee teachers toward computers in the classroom, Tennessee state University, *Dissertation Abstract International, 48*(11),-2799.

Ogunkola, B. J. (2008). Computer attitude , ownership and use as predicators of computer literacy of science teachers in Nigeria. *International journal of Environment & science Ed.cation,3*(2),53-57.

Ozgen, K., & Bindak, R. (2012). Examining student opinions on computer use based on the learning styles in mathematics education. *The Turkish Online Journal of Educational Technology,11*(1).

Parhar, M. (1994). A study of effect of media on students learning. PhD, Ed. Jamia Millia Islamia. Guide: prof Girija Mohd. Miyan *in 2006 sixth survey of Educational Research (1993-2000) vol.I* p. 156. NCERT New Delhi.

Rao, L. N. (1984). A study of factors influencing the effective use of audio-visual equipments and materials in classroom teaching. PhD, Ed., SVU in Buch, M. B. (1991) *Fourth survey of research on Education (1983-1988) vol.I* p.p.794-795 NCERT New Delhi.

Sadik, A. (2006). Factors influencing teachers' attitude towards personal use and school use of computers: New evidence from a developing nation, *Evaluation Review, 30*(1), 86-113.

SCERT, ORISSA. (1982). An on the Spot Evaluative study on school Broadcast Programme in the towns of Cuttack and Bhubaneswar in Orissa. In Buch, M.B (1991) *Fourth Survey of sResearch in Education (1983-1988) Vol.I* p.798. NCERT New Delhi.

Sibal, K. (2012, June). *59th Meeting of Central Advisory Board of Education Ministry of human resource development*. 20:49 IST Press information burean, Govt of India. 27-dec-2012. Retrieved from http://pib.nic.in/newsite/erelease.aspx?relid=84739

The Cognition and Technology Group at Vanderbilt (1990). Anchored instruction and its relationship to situated cognition. *Educational Researcher 19*(5), 2–10.

Vandana & Tanvi (2007). *Students Attitude towards the use of Information Technology in Education.* Retrieved from www.rim/engg.com/cott2008,proceedings/M803, on 22 April, 2008.

Wiken,G., & Molster, T. (2011). Norwegian secondary school teachers and ICT in Harmer Norway. *European Journal of Teacher Education, 34*(2), 209-218. Retrieved from http://www.informaworld.com.

# Chapter-5

# Summary, Conclusion, Implications, Recommendations And Suggestions

Chapter -5

# SUMMARY, CONCLUSION, IMPLICATIONS, RECOMMENDATIONS AND SUGGESTIONS

5.1 Summary of the study

5.1.1 Objectives

5.1.2 Hypothesis

5.1.3 Methods Employed

5.1.4 Findings

5.2 Conclusion

5.3 Educational Implications

5.4 Recommendations for Practice

5.5 Suggestions for further Study

# CHAPTER 5

# SUMMARY, CONCLUSION, IMPLICATIONS, RECOMMENDATIONS AND SUGGESTIONS

Education is a hub for ensuring the well-being of our society and the education of secondary level is an essential juncture where the school can uphold the use of ICT. The effective use of ICTs in the Higher Secondary Schools can provide the timely transmission of information and knowledge, thereby helping not only the students but also the teachers to meet the challenges of the education system. The schools need the support of ICTs to improve the quality of teaching and learning process. The teachers and the students are a key component of the schools and therefore the impact of ICT for teachers as well as students and the strategies they adopt to facilitate the teaching and learning environment are imperative. ICT in the education is perceived by the educators and learners, to have a positive impact on the schools. The need of ICT competent students stems from the need of ICT competent teachers. ICTs are becoming increasingly important in education and new information and communication technologies have opened up new potentials which are very essential for teaching and learning process, but to take benefit from the ICTs it is necessary to make these available in the schools and their usage can provide new and innovative means to bring educational opportunities to a greater number of people. Recognizing the importance of availability and use of ICT in the schools, this study was carried out with an objective to investigate the status of ICT and to examine its usage in the Higher Secondary Schools of Jammu and Kashmir. Gaps in prior researches indicate the need for the additional study on this topic.

This chapter has been divided into five sections. The first section is composed of summary comprising the objectives, hypothesis, methodology and findings of the study, while the second section contains conclusion, the third section has been presented to throw light upon the implications of the findings and the fourth section puts forward recommendations based on research work done. The fifth section focuses on the suggestions for further study.

## 5.1 Summary of the study

This research study scrutinized the Status and Usage of ICT in Higher Secondary Schools of Jammu and Kashmir. The description of the objectives, hypothesis, methodology and findings are given as follows:

### 5.1.1 Objectives

The present study had a few objectives which are as under:

1. **To identify the Status of ICT in Higher Secondary Schools.**
2. **To find out the level of ICT Usage by the Students of Higher Secondary Schools.**
3. **To find out the level of ICT Usage by the Teachers of Higher Secondary Schools.**

### 5.1.2 Hypotheses of the Study

The following hypotheses were established for the present study:

**Hypothesis 1**: There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Government Higher Secondary Schools.

1.1 There is a medium level of ICT usage by the students of Government Boys Higher Secondary Schools (GBHSS).

1.2 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Government Girls Higher Secondary Schools (GGHSS).

1.3 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Government Co-Educational Higher Secondary Schools [G (Co-Ed.) HSS].

**Hypothesis 2**: There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Private Higher Secondary Schools.

2.1 There is a medium level of ICT usage by the students in Private Boys Higher Secondary Schools (PBHSS).

2.2 There is a medium level of ICT usage by the students in Private Girls Higher Secondary Schools (PGHSS).

2.3 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the students of Private Co-Educational Higher Secondary Schools [P (Co-Ed.) HSS].

**Hypothesis 3**: There is no significant difference between the Government and Private Higher Secondary School Students in the level of ICT usage.

3.1 There is no significant difference between Government and Private Boys Higher Secondary School students in the level of ICT usage.

3.2 There is no significant difference between Government and Private Girls Higher Secondary School students in the level of ICT usage.

3.3 There is no significant difference between Government and Private Co-Educational Higher Secondary School students in the level of ICT usage.

**Hypothesis 4**: There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Higher Secondary Schools.

4.1 There is a medium level of ICT usage by the teachers of Government Boys Higher Secondary Schools.

4.2 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Girls Higher Secondary Schools.

4.3 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Government Co-Educational Higher Secondary Schools.

**Hypothesis 5**: There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Private Higher Secondary Schools.

5.1 There is a medium level of ICT usage by the teachers of Private Boys Higher Secondary Schools.

5.2 There is a medium level of ICT usage by the teachers of Private Girls Higher Secondary Schools.

5.3 There is no significant difference between the real mean and assumed mean in the level of ICT usage by the teachers of Private Co-Educational Higher Secondary Schools.

**Hypothesis 6**: There is no significant difference between the Government and Private Higher Secondary School teachers in the level of ICT usage.

6.1 There is no significant difference between Government and Private Boys Higher Secondary School teachers in the level of ICT usage.

6.2 There is no significant difference between Government and Private Girls Higher Secondary School teachers in the level of ICT usage.

6.3 There is no significant difference between Government and Private Co-Educational Higher Secondary School teachers in the level of ICT usage.

### 5.1.3 Methodology & Procedures

The third chapter gives the complete description of the methods and procedures which were carried out in the research study. A sample of the study has been categorized into three sections, first section comprised of 53 Higher Secondary Schools (HSS), all the HSS of target population were taken into consideration and were selected by using the purposive sampling, the second and third sections encompassed 265 students and 462 teachers which were selected by using a stratified random sampling technique with the percentage of (2) and (5) respectively out of the target population. Keeping in view the research endeavor, the information schedule and the questionnaires were framed. The validity (face and construct validity) and reliability of the questionnaires were established. The original inventory was modified

and a pilot study was conducted on 53 students and 53 teachers to establish the reliability in Indian conditions. These tools were administered to the samples and the data obtained were analyzed with the help of SPSS, subjected to the statistical technique mean, SD, t-test for one sample, independent samples test, Kolmogorov-Smirnov test for one sample and Mann-Whitney U test for independent samples.

The fourth chapter restrains the whole description and discussion of the analysis and result along with the necessary tables and their interpretation.

### 5.1.4 Findings

The main findings emanating from the present investigation comprises of three sections which are as follows:

**Section I**

**Status of ICT in Higher Secondary Schools**

1. In all the GHSS the Status of ICT items such as Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Chart, and Calculator was (100%). The items like Computer, Video-Cassette, CD-Player, DVD-Player, CD/DVD was (53.3%) and the items such as Internet, T.V and Radio was (11.1%), Projector (6.7%), Film (84.4%) and the other items like LCD Projector, Slide-Projector, Film Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference, Video-Conference were not available in the GHSS as a percentage was zero.

2. In the GBHSS the Status of ICT items such as Computer, Film, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, CD-Player, DVD-Player, CD/DVD, Loud-Speaker, Chart, and Calculator was (100%). The other items like Internet, Projector, T.V and Radio was (33.3%) and the other items like LCD Projector, Slide-Projector, Film Projector, Epidiascope, On-line-

teaching/ learning, Smart-board, Audio-Conference, Video-Conference were not available in GBHSS as the percentage was zero.

3. In the GGHSS the Status of ICT items such as Computer, Video-Cassette, CD-Player, DVD-Player, CD/DVD was (62.5%) and the Status of the items like Internet, Projector, T.V and Radio was (12.5%). The items like LCD Projector, Slide-Projector, Film Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference and Video-Conference were not available, as the percentage was zero (0) whereas Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Loud-Speaker, Film, Chart, and Calculator were available in all GGHSS as the percentage was 100%.

4. In the G (Co-Ed.) HSS the Status of ICT items such as Internet, T.V and Radio was (8.8%), Projector (2.9%), Film (79.4%) and the other items like Computer, Video-Cassette, CD-Player, DVD-Player, CD/DVD was (47.1%) whereas the items like LCD Projector, Slide-Projector, Film Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference, Video-Conference were not available as the percentage was zero (0). The other items like Tape-recorders, Audio-Cassettes, Blackboards, Whiteboards, Loud-Speakers, Charts, and Calculators were available in G (Co-Ed.) HSS as the percentage was 100.

5. The Status of (9) ICT items (like Computer, Internet, Projector, Video-Cassette, CD-Player, DVD-Player, CD/DVD, TV and Radio) was higher in GBHSS as compared to GGHSS and G (Co-Edu.) HSS whereas as the Status of the other ICT items was same in all these three types of schools except the one ICT item (i.e., Film).

6. In PHSS, the Status of ICT items such as Internet and Radio was (62.5%) Projector, Film Projector, CD-Player, DVD-Player and CD/DVD was (50%), Loud-Speaker was (87.5%) and other items like LCD Projector, Slide-Projector, Epidiascope, On-line-teaching/learning, Smart-board, Audio-Conference, Video-Conference were not available as the percentage was zero (0) and the items like Computer, Films, Tape-recorders, Audio-Cassettes,

Video-Cassettes, Blackboards, Whiteboards, T.V, Charts, Calculators were available in all the PHSS as the percentage was 100.

7. In PBHSS, the Status of ICT items such as Computer, Internet, Projector, Film, Film Projectors, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, CD-Player, DVD-Player, CDs/DVD, Loud-Speaker, T.V, Radio, Chart and Calculator was (100%) and other items like, LCD Projector, Slide-Projector Epidiascope, On-line-teaching/ learning, Smart-board, Audio-Conference and Video-Conference were not available as the percentage was zero.

8. In PGHSS, the Status of ICT items like Computer, Internet, Projector, Film, Film Projector, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, CD-Player, DVD-Player, CD/DVD, Loud-Speaker, T.V, Radio, Chart and Calculator was (100%) and other items like, LCD Projector, Slide-Projector, Epidiascope, On-line teaching/learning, Smart-board, Audio-Conference and Video-Conference were not available in this Private School as the percentage was zero.

9. In P (Co-Ed.) HSS, the Status of ICT items such as Internet and Radio was (50%), Projector, Film Projector, CD-Player, DVD-Player and CD/DVD was (33.3%), Loud-Speaker was (83.3%) and other items like, LCD Projector, Slide-Projector, Epidiascope, On-line teaching/learning, Smart-board, Audio-Conference, Video-Conference was zero and the items like Computer, Film, Tape-recorder, Audio-Cassette, Video-Cassette, Blackboard, Whiteboard, T.V, Chart and Calculator were fully available as the percentage was 100.

10. There was no difference in the Status of (17) ICT items like (Computer, LCD Projector, Slide-Projector, Epidiascope, Tape-recorder, Audio-Cassette, Video-Cassette, On-line-teaching/learning, Blackboard, Smart-board, Whiteboard, Audio-Conference, Video-Conference, T.V, Charts, Calculator) in PBHSS, PGHSS and P (Co-Ed.) HSS .While as in P (Co-Ed.) HSS the Status of items like Internet, Projector, Film Projector, CD-Player, DVD-Player, CD/DVD, Loud-Speaker and Radio was low as compared to PBHSS and PGHSS.

11. There was no difference in the Status of some ICT items like Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Chart and Calculator as the Status of these items was same in both the schools while as there was a high percentage of the other items in PHSS as compared to GHSS.

12. There was no difference in the Status of some ICT items like Computer, LCD Projector, Slide-Projector, Film, Film Projector, Epidiascope, Tape-recorder, Audio-Cassette, Video-Cassette, On-line-teaching/learning, Blackboard, Smart-board, Whiteboard, CD-Player, DVD-Player, CD/DVD, Audio-Conference, Video-Conference, Loud-Speaker, Chart and Calculator as the Status of these items was same in both the schools while as the Status of the other items was higher in PBHSS as compared to GBHSS.

13. There was no difference in the Status (15) ICT items like ( LCD Projector, Slide-Projector, Film, Epidiascope, Tape-recorder, Audio-cassette, On-line-teaching/learning, Blackboard, Smart-board, Whiteboard, Audio-Conference, Video-Conference, Loud-Speaker, Chart and Calculator) in PGHSS and GGHSS but there was high percentage of the other (10) ICT items like (Computer, Internet, Projector, Film Projector, Video-Cassette, CD-Player, DVD-Player, CD/DVD, TV and Radio) in PGHSS as compared to GGHSS.

14. There was no difference between the Status (13) ICT items (like LCD Projector, Slide Projector, Epidiascope, Tape-recorder, Audio-Cassette, On-line teaching/learning, Blackboard, Smart-board, Whiteboard, Audio-Conference, Video-Conference, Chart and Calculator in P (Co-Ed.) HSS and G (Co-Ed.) HSS. The status of (8) ICT items like (Computer, Internet, Projector, Film, Film Projector, Video Cassette, TV and Radio) was higher in P (Co-Ed.) HSS as compared to G (Co-Ed.) HSS and the status of other remaining (4) ICT items like (CD-Player, DVD-Player, CD/DVD and Loud-Speaker) was slightly higher in G (Co-Ed.) HSS as compared to P (Co-Ed.) HSS.

**Section II**

**Usage of ICT by the Students of Higher Secondary Schools**

15. The level of ICT Usage by the students was low in the Government Higher Secondary School, because the real mean (35.68) was lower than the assumed mean (50).

16. The level of ICT Usage by the students was low in the Government Boys Higher Secondary School, as the real mean (38.86) was less than the assumed mean (50).

17. The level of ICT Usage by the students was low in the Government Girls Higher Secondary School, as the real mean (36.47) was less than the assumed mean (50).

18. The level of ICT Usage by the students was low in the Government Co-Educational Higher Secondary School, as the real mean (35.21) was less than the assumed mean (50).

19. The level of ICT Usage by the students was low in the Private Higher Secondary School, because the real mean (46.1) was less than the assumed mean (50).

20. The level of ICT Usage by the students was good in the Private Boys Higher Secondary School, because the real mean (53.2) was elevated than the assumed mean (50).

21. The level of ICT Usage by the students was good in the Private Girls Higher Secondary School, because the real mean (51.6) was elevated than the assumed mean (50).

22. The level of ICT Usage by the students was low in the Private Co-Educational Higher Secondary School, because the real mean (44) was lower than the assumed mean (50).

23. The level of ICT usage by the Private Higher Secondary Schools (PHSS) students was better as compared to the Government Higher Secondary schools

GHSS as the real mean of PHSS was higher as compared to the real mean of GHSS.

24. The level of ICT usage by the PBHSS students was better as compared to the GBHSS

25. The level of ICT usage by the PGHSS students was better as compared to the GGHSS

26. The level of ICT usage by the P (Co-Ed.) HSS students was better as compared to the G (Co-Ed.) HSS.

**Section III**

**Usage of ICT by the Teachers of Higher Secondary Schools**

27. The level of ICT Usage by the teachers was low in the Government Higher Secondary School, because the real mean (35.97) was lower than the assumed mean (50).

28. The level of ICT Usage by the teachers was low in the Government Boys Higher Secondary School, as the real mean (39.38) was less than the assumed mean (50).

29. The level of ICT Usage by the teachers was low in the Government Girls Higher Secondary School, as the real mean (36.81) was less than the assumed mean (50).

30. The level of ICT Usage by the teachers was low in the Government (Co-Ed.) Higher Secondary School, as the real mean (35.45) was less than the assumed mean (50).

31. The level of ICT Usage by the teachers was low in the Private Higher Secondary School, because the real mean (47.48) was less than the assumed mean (50).

32. The level of ICT Usage by the teachers was good in the Private Boys Higher Secondary School, because the real mean (53.2) was elevated than the assumed mean (50).

33. The level of ICT Usage by the teachers was good in the Private Girls Higher Secondary School, because the real mean (51.6) was elevated than the assumed mean (50).

34. The level of ICT Usage by the teachers was low in the Private (Co-Ed.) Higher Secondary School, because the real mean (45.42) was lower than the assumed mean (50).

35. The level of ICT usage by the PHSS teachers was better as compared to the GHSS as the real mean of PHSS was higher as compared to the real mean of GHSS.

36. The level of ICT usage by the PBHSS teachers was better as compared to the GBHSS

37. The level of ICT usage by the PGHSS teachers was better as compared to the GGHSS

38. The level of ICT usage by the P (Co-Ed.) HSS teachers was better as compared to the G (Co-Ed.) HSS.

## 5.2 Conclusion

In the light of the descriptions, discussions and results, the conclusions were accordingly drawn. The present study was an effort to examine the Status and the Usage of ICT in the Higher Secondary Schools of Jammu and Kashmir with (462) teachers and (265) students taken from (53) Higher Secondary Schools of the target population. Therefore, in quest of drawing conclusions, the three sections were formed in accordance to the sample, i.e. the sample taken from the school the for concluding the Status of ICT in schools followed by the sample of the students and the teacher to conclude the Usage by them in the Schools. The sample-wise conclusion follows as:

**Result from the sample of HSS**

The result revealed the fact that the Status of ICT in Higher Secondary Schools (either Government or Private) was inadequate. As per the result it has been concluded that there was no availability of the ICT items such as LCD Projector, Slide Projector, Film Projector, Epidiascope, On-line teaching/learning, Smart-boards Audio-Conference and Video-Conference. Therefore it has been also revealed in the result that there was squat of ICT items such as Computer, Film, Internet, Projector, Video-Cassette, CD-Player, DVD-Player, CD/DVD, Loud-Speaker, T.V and Radio. The ICT items like Tape-recorder, Audio-Cassette, Blackboard, Whiteboard, Chart and Calculator were easily available which were traditionally used in the classrooms. Therefore it has been further wrapped up that there was low status of ICT in almost all the Higher Secondary Schools.

**Result of the respondents (students)**

Under the category of this sample, results indicated that the level of using ICT with all the Government School Students such as GBHSS, GGHSS and G (Co-Ed.) HSS was low, as the difference was observed between their real mean and assumed mean. This provides credence that these items were not available in the schools, consequently it has been concluded that the basic problems found was lack of ICT items in the schools, especially at higher secondary level. The result also revealed that level of using ICT was medium, as far as the students of Private (Boys and Girls) Higher Secondary Schools were concerned. Therefore it has been wrapped up that the level of ICT usage by students of Private Boys Higher Secondary Schools was medium, according to the availability of ICT in their schools. On the other hand the result also exposed that the students of Private (Co-Ed.) Higher Secondary Schools were not using ICT in medium level as the real mean was observed less than the assumed mean.

**Result of the respondents (teachers)**

Results under this sample revealed the same that is the levels of using ICT by Government School teachers was low almost in all the schools as the difference was observed between their real mean and assumed mean. In different types of Government schools (GBHSS), (GGHSS) and [G (Co-Ed.) HSS] ICT was not used by the teachers. Results also provided credibility that there was a medium level of using ICT by the teachers of Private (Boys and Girls) Higher Secondary Schools. The real mean of usage by the teachers the assumed mean that showed the Usage of ICT was low in Government schools. As far as Private school teachers were concerned, less usage of ICT by them was concluded. Findings also disclose that there was a medium level of usage of ICT by the teachers of Private (Boys and Girls) Higher Secondary Schools. The real mean of usage by the teachers exceeds the assumed mean that showed the teachers were using ICT in medium level. But the teachers of Private (Co-Ed.) Higher Secondary Schools were not using ICT in medium level as the real mean of Usage by the teachers was lower than the assumed mean.

Education through ICT provides awareness among the teachers and the students and has a positive impact on the present society. ICT can be employed in all the Higher Secondary Schools by means of appropriate and suitable ways. It can be helpful to a great extent if it is implemented in the schools properly. Healthy Status and flexible Usage of ICT can create a perfect environment for teachers and students to fulfill the needs in real-life knowledge-based digital world. As to conclude, the schools and classrooms of the future may give efficient and effective tools for students and teachers, and prepare students to enter and effectively compete in the ever-expanding high-tech global marketplace. Conclusively, a lot of quality improvement can be done in the field of ICT through careful and planned implementation of ICT in education.

## 5.3 Educational implications

The researches without education implication are always considered to be useless. Therefore, it is necessary to highlight the implications of the present investigation. ICT can bring drastic changes in the education scenario only if the

environment of using ICT is created in schools. Since, the present investigation was aimed to study the status and usage of ICT in higher secondary schools of Jammu and Kashmir, so it seems imperative to highlight the implications of status and usage of ICT in schools.

The status and usage of ICT can create a perfect environment for teachers and students to make the teaching and learning more interesting and effective. Educationists all over the world have emphasized that ICT is the most dynamic factor in preparing the teachers and students to cope-up with the present society. In this perspective, observations and findings of the present study related to the status and usage of ICT in higher secondary school in Jammu and Kashmir may have strong and useful educational implications in the existing educational setup of the country.

The findings of the study throw light to existing knowledge on the status and usage of ICT in higher secondary schools. In addition to providing empirical data to fill in the gap in national as well as international literature, this study provides useful information that may be of great value to researchers in the developing countries. In the light of the findings of this study, the further researches could be undertaken to generate more information on similar and related aspects in order to strengthen the means and ways to identify the status and check the extent of the ICT in the schools and therefore contributing towards improvements in the status and the usage of ICT in the schools.

Usage of ICT in the classrooms and schools is very essential. Teaching through ICT retains for a long time in the minds of the students because the tools grab the attention of the students. At high School and higher Secondary level, all subjects can be taught with the help of ICT items. Moreover, some important lectures related to any subject delivered by eminent scholars or resourceful persons can be stored in computers or other ICT tools and easily be shown to the students so that they can get updated information from these lessons or the lectures.

The results of this study may be useful in identifying the usage of ICT by the teachers as well as by the students and the resources provided to them; so that proper training to the teachers could be provided for the implementation of the ICT tools in the schools. Moreover, the informative knowledge about the trainings of teachers

could be gathered and also be utilized to suggest better ways of training and handling the equipments in a proper way.

ICT is a basic tool which can be utilized by teachers and students to find out any information regarding the indispensable needs. The information generated could also be utilized to suggest better ways of teaching, motivating students with new techniques and approaches. ICT based teaching-learning could make the school environment very interactive and is liked by students.

ICT in the schools helps in providing and getting more effective education for both teachers and students and availability of the ICT resources must be structured and organized in such a way that it facilitates the finding and use of learning materials for different levels of secondary stage.

Based on the findings, the Government of Jammu and Kashmir may possibly be acquainted with the stipulation of ICT in schools and may also be familiar with the low level of using ICT in schools which could be changed in certain manner and can take the necessary steps either to make ICT items available or to foster them in the schools. The Jammu and Kashmir State Board of School Education, the policy makers, the management and the administration can take advantage from the current study so as to make the sound Status of ICT possible in all the schools and the benefits of the current Status of ICT and its low Usage should be taken into account. Over the past years, the Indian Ministry of Education has made enormous investments in establishing the infrastructure in schools. Thus the findings of the study should be of practical interest to the Government of Jammu and Kashmir. Administrators would find it useful to assess the status and usage of ICT in schools by students as well as teachers, so that funding for ICT items and its implementation can be optimally directed.

### 5.4 Recommendations for Practice

The study revealed that schools need to have the facilities of ICT items, the students and the teachers require to make out the proper usage of ICT items. The schools and classrooms of the future may give effective tools for students and

teachers, and prepare students to enter and successfully compete in the ever-expanding high-tech global marketplace. The provision of ICT trainings for the students and the teachers especially during the early years of teaching and learning process and the orientation programs, seminars, workshops may be organized by the school authorities not only to make the teaching and learning effective but also to update the students and teachers about new developments, new trends and new techniques of using ICT in schools.

The results of the study indicated that the status of ICT was generally low in all the higher secondary schools. Despite the different limitations, regarding its availability, the level of usage was a bit better in the private schools as compared to the government schools. It is essential for policy-makers to sustain and promote the status/availability of ICT, as a prerequisite for deriving the benefits of ICT initiatives in schools. Effective development of ICT in schools and the enhanced use of ICT in the school require a holistic approach comprising proper training (appropriate in terms of proficiency, acquaintance, application of educational objectives and priorities and delivery), complete access to ICT resources and ongoing support and advice to encourage progression beyond any formal training.

Some of the recommendations are discussed below:

1. The status of ICT in the schools must be tackled adequately by the Government of Jammu and Kashmir. There is a need of implementing the important ICT items in the schools for the betterment of not only the students and teachers but also for the whole society. The teachers and the students are the backbone of the society and the educational process is dependent on these two.

2. The SIET's, DIET's, JKBOSE and school administration should publicly respect, recognize and reward those schools who have successfully integrated ICT in their classrooms. These schools should be given the additional financial assistance as remuneration.

3. The transparency in the whole system of school functioning can be brought up with proper implementation of ICT. With the help of transparent system everyone including the citizens, the schools, the zonal offices, the district

offices, the regional offices, and the various branches at the complex head of different schools can share information using the ICT items.

4. Information for all stakeholders—students, teachers and administrators should be available online through different web-sites of the State Board of School Education. This includes information regarding the admissions, the mark sheets, attendance of the teachers, transfers, pay slips, etc. which help in making less efforts and also saving the time of not only the school teachers and students but administration as well.

5. ICT can be used for better management of records by making a complete database of all the students in various classes. Once the students are registered in the schools, a unique number is generated called reference number and it is provided to the particular students. Students will be saved from a lot of hardships they face in depositing fees, taking exams and much more. Exam results in such cases may be provided online on the same day as the same is happening in case of online exams and entrance tests. This would help to fix the problem of the delay in declaration of results of various exams by various schools.

6. The integration of ICT into the syllabus and curriculum of the schools covers a wide range of academic and technical topics to support and act as a guide for the school teachers in the lesson presentation. ICT plays a role to deliver, store, protect, transmit and retrieve information from the rest of the world for teachers' and students' excellence in the teaching and learning process.

7. The students should be taught by highly qualified and experienced faculty so that they can become better users of ICT and will know its proper utilization in the classrooms. Moreover the accurate, meaningful and regular feedback should be provided to the students regarding their ICT usage and students should be motivated for the usage of ICT. The ICTs can be used as a tool to solve different types of problems in the development of student thinking or in creative activities, to support collaboration among all participants of learning process as a standard component of the educational environment.

8. Teachers may present a role model of high quality teaching. This means not depending primarily or exclusively on the commonly used stand and deliver approach. Some of the most plausible and innovative suggestions for teachers to implement ICT as a potential and promising technique are:

   - Teachers are required to make effective use of ICT for communicating with students.
   - The teacher should be capable of transferring the adequate knowledge of the ICT.
   - The teacher should be enabled to face the challenges of liberalization, privatization and globalization in the educational sector.
   - Teachers should appropriately teach ICT as part of the content of the course.
   - Teachers may encourage and facilitate students making appropriate use of the Computers, Projectors, TVs and other ICT aids. ICT makes them enable for the learning of course material, doing the course assignments, exchange a few words with the course faculty members and to be in touch with their fellow students.

9. Some orientation programs and workshops should be organized by the school authorities to train the teachers so that they can implement ICT in the classrooms.

The main challenge before the education system in India concerns with the lack of reach and access of ICT in education. The present study overall, revealed that there was low status and low level of usage of ICT in Higher Secondary Schools of Jammu and Kashmir. But the level of usage by the private school students and teachers was better as compared to the government schools. Furthermore, integrating ICT in education is very crucial for the betterment of the schools. In many parts of the country, the national vision for ICT usage in education has been integrated into schools.

## 5.5 Suggestions for Further Research

In the light of the pros and cons in carrying out the research investigation, the suggestions for further investigations have been specified. Research is not the end of an investigation but it constantly opens the way for future endeavors. Studying the results, obtained through the study, the following suggestions were established:

1. Akin studies are needed to produce more information in this area. Such studies may change the situation, the population, the sampling procedures, or the data collection methods utilized in the current study. For example, further researchers may examine schools, students, teachers from different disciplines, or a sample from a larger population in other parts of the country to provide more diversity and a wider perspective of the research or with higher access to ICT.

2. The present research was carried on the schools (students and teachers) undertaken from all the Higher Secondary Schools of District Anantnag. Therefore, it minimizes the generality of the findings. Consequently, it is suggested that such type of study must be conducted in the Primary Schools, the Elementary schools, the High Schools, the Colleges etc. on a relatively from across various sections of the population.

3. It would be interesting to assess the status of ICT in the Higher Educational Institutions and to identify the level of ICT usage by the students, teachers, principals, and other officials working in these institutions.

4. The analysis of data showed that the level of usage of ICT by the Government Schools Students was low as compared to Private Schools. Further research should include a large sample of students to compare the level of ICT usage between the Government School and Private School students.

5. The results also revealed that the level of usage of ICT by the Government School teachers was low as compared to Private Schools. Further research should include a large sample of teachers to compare the level of ICT usage between the Government School and Private School teachers.

6. The study did not examine the status of the modern and conventional ICT tools separately which should be taken into consideration.

7. The study did not examine the level of using ICT by the teachers in relation to their experience, qualification, pay-band, age and gender and the level of using ICT by the students in relation to their age, gender and the classes in which they read. The relationships amongst variables should be taken into consideration.

In the present study, the three constructs: information schedule and questionnaire for students and questionnaire for teachers, have been identified as a factor that can lead to improve the Status and the Usage of ICT in Higher Secondary Schools. Therefore, the educationists and policy makers must continue exploring and identifying the variety and complexity of these as well as the related factors that influence the level of ICT usage in Higher Secondary Schools, since these factors and their interactions may vary across different socio-cultural and economic setup throughout the globe.

# Bibliography

## BIBLIOGRAPHY


Asiedu-Akrofi, K. (1978). *School organization in modern Africa.* Tema: Ghana Publishing Corporation.

Best, J. W., & Kahn, J. V. (1993). *Research in Education.* (7th Edition). Needham Heights, MA: Allyn and Bacon.

Best, J. W., & Kahn, J. V. (2006) *Research in Education.* (9th Edition). Pearson Education, Inc and Dorling Kindersley. Pearson Prentice Hall South Asia.

Bhushan, A., & Ahuja, M. (1992). *Educational technology theory; theory and practice in teaching learning process.* Meerut: Vivek publishers.

Borg, W. R., & Gall, M. D. (1989). *An Introduction* (5th ed.). New York: Longman.US

Braak, S. J.(2001). Factors influencing the use of computer mediated communication by teachers in secondary education. *Computers & Education, 36*(1), 41-47.

Brown, J. D. (1996). *Testing in language program.* Upper Saddle River, NJ: Prentice-Hall Regents.

Bryman, A., & Cramer, D. (2001). *Quantitative data analysis with SPSS Release 10 for windows: A guide for social scientists.* Philadelphia: Routledge, Taylor & Francis Group.

Buch, M. B. (1987). *Third survey of research in education. National Council of educational research and trainings. (1978-1983).Vol.I.* NCERT. New Delhi.

Buch, M. B. (1987). *Third survey of research in education. National Council of educational research and trainings. (1978-1983).Vol.II.* NCERT. New Delhi

Buch, M. B. (1991). *Fourth survey of research in education. National Council of educational research and trainings. (1983-1988).Vol.I.* NCERT. New Delhi.

Buch, M. B. (1997). *Fifth survey of research in education. National Council of educational research and trainings. (1988-1992).Vol.I.* NCERT. New Delhi.

Burki, S. J. (2007). *Kashmir: A Problem in Search of a Solution.* Washington, DC: United States Institute of Peace.

Cave, J. (1986). *Technology in school.* London: Rutledge.

Chin, S., & Hortin, J. A. (1994). Teachers' perceptions of instructional technology and staff development. *Journal of educational Technology systems, 22*(2) 83-98.

Coopersmith, J. (2009). *Characteristics of public, private, and Bureau of Indian Education elementary and secondary school teachers in the United States: Results from the 2007-08 Schools and Staffing Survey* (NCES 2009-324). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Cotterell, J. L. (1984). Effects of school architectural design on student and teacher anxiety. *Environment and Behavior, 16*(4), 455-479.

Dabla, B. (2007). *Multi-dimensional Problems of Women in Kashmir Jammu and Kashmir.* New Delhi: Gyan Publications:

Dabla, B. (2010). *A Sociological Study of Widows and Orphans in Kashmir.* Jammu and Kashmir, Srinagar, India: Jay kay Books.

Dabla, B. (2010). *Sociological papers on Kashmir- Conflict Situation and its Impact" Vol. 1.* Jammu and Kashmir: Jay kay Books.

Dabla, B. A. (2010). *Sociological Papers on Kashmir, Vol. 1& 2.* Srinagar: JAYKAY publications.

Dabla, B. A., Nayak, S. K., & Khurshid -ul-Islam (2000). *Gender Discrimination in the Kashmir Valley; A Survey of Budgam and Baramulla Districts.* New Delhi: Gyan Publications.

Das, R.C. (1993). *Educational Technology A basic text.* New Delhi: sterling 1993.

Earle, R.(2002). The integration of instructional technology into public education: Promises and challenges. *Educational technology, Jan-Feb,* 5-13

Empirica (2006). *Benchmarking access and use of ICT in European schools 2006.* Final report from Head teacher and Classroom Teachers Surveys in 27 European countries. Germany European Commission.

Eng, T. S. (2005). The impact of ICT on learning: A review of research. International Education Journal, 2005. 6 (5), 635-650

Field, A. (2006). *Discovering Statistics Using SPSS* (2nd ed.). Britain: London Sage Publication.

Gay, L. R., & Airasian, P. (2000). *Educational Research: Competencies for Analysis and Application* (6th ed.). New Jersey: Prentice-Hall,Inc.

George, D., & Mallery, P. (2007). *SPSS for Windows Step by Step.* A Simple Guide and Reference (Sixth Edition) Pearson Education, Inc and Dorling Publishing, Inc.

Good, C.V. (1973). *Dictionary of Education* (2nd ed.). McGrow Hill Book Company: New York, P.64.

Government of Jammu & Kashmir. (2007). *Digest of statistics, Jammu & Kashmir.* Srinagar: Education Department, Jammu & Kashmir.

Government of Jammu and Kashmir. (1982). Director codes, *Finance Department Notified Revised Pay Rules,* Vide SRO-91 Dated 22nd March, 1982. Jammu/Srinagar: Rambir Government Press

Government of Jammu and Kashmir. (1987). Director codes, *Finance Department Notified Revised Pay Rules,* Vide SRO-370 Dated 17th July, 1987. Jammu/Srinagar: Rambir Government Press

Government of Jammu and Kashmir. (1992). Director codes, *Finance Department Notified Revised Pay Rules,* Vide SRO-75 Dated 30 March, 1992. Jammu/Srinagar: Rambir Government Press

Government of Jammu and Kashmir. (1996). Director codes, *Finance Department Notified Revised Pay Rules,* Vide SRO-14 Dated 15th Jan, 1996. Jammu/Srinagar: Rambir Government Press

Government of Jammu and Kashmir. (2009). Director codes, *Finance Department Notified Revised Pay Rules,* Vide SRO-93 Dated 15th April, 2009. Jammu/Srinagar: Rambir Government Press.

Greene, J., & D'Oliveira, M. ( 2005). *Learning to use Statistical tests in Psychology* (3rd ed.). England: Open University Press McGraw- Hill.

Hafkin, N. (2000) 'Convergsence of Concepts: Gender and ICTs in Africa,' in Rathgeber, E. and Adera, E.O. (eds), *Gender and the Information Revolution in Africa*, International Development Research Center, Ottawa, pp. 1–15

Hawes, L. S. (1982). *The concise dictionary of education.* New York: Van Nostrant Rinehart Company.

Hornby, A. S. (2005). *Oxford advanced learner's dictionary of current English.* Oxford: Oxford University Press.

Journal of Educational Technology. (1999). *All india association for educational technology*. Vol. II. Number 4, July 1999. F-5/E, DDA, Munirka, New Delhi India.

Journal of Educational Technology. (1999). *All Indian association for educational technology, Vol. II*, Number 2, January 1999.

Journal of Educational Technology. (1999). *All Indian association for educational technology Vol. 12*, Number 1, October.

Journal of Educational Technology. (1999). *All indian association for educational technology, Vol. II*, Number 3, April 1999.

Journal of Educational Technology. (2000). *Media and technology for human resource development, Vol. 12*, Number 2003, January and April.

Journal of Indian Education. (1999). *National council of educational research and training*, November 1999.

Kerlinger, F. N. (1983). *Foundations of Behavioural Research* (2nd ed.). New York: Holt, Reinhart and Wiston.

Kreft, L. G. G. (1993). Using multilevel analyses to assess school effectiveness: A study of Dutch secondary schools. *Sociology of Education, 66*, 104-129.

LeBlanc, L., Swisher, R., Vitaro, F., & Tremblay, R. E. (2007). School social climate and teachers' perceptions of classroom behavior problems: A 10 year longitudinal and multilevel study. *Social Psychology of Education, 10*, 429–442.

Lepedes, D. N. (1974). *Dictionary of science and technical terms*. New York: M.Graw Hill.

Maheshwari, A. (2013). *Cerescent over kashmir*. New Delhi: Rupa & Co.

Mangal, S. K. (2010). *Statistics in Psychology and Education* (2nd ed.). New Delhi: PHI Learning Private Limited.

Mathur, S.K. (2009). Financial analysis of the ICT industry: A regulatory perspective. Journal of infrastructure Development. 1 (10, 17-43, Sage.

McCowan, T. (2010). School democratization us pre figurative form: Two Brazilian experiences. Education, citizenship and social Justice.5 (1) 21-41

McDill, E. L., & Rigsby, L. C. (1973). *Structure and process in secondary schools: The academic impact of educational climates.* Baltimore, Md.: Johns Hopkins University Press.

Michael, V. P. (1985). *Research Methodology in Management* (2nd ed.) Bombay: Himalaya Publishing House.

Midgley, C., Anderman, E., & Hicks, L. (1995). Differences between elementary and middle school teachers and students: A goal theory approach. *Journal of Early Adolescence, 15*, 90-113.

Miller, S. I., & Fredericks, J. (1990). The false ontology of school climate effects. *Educational Theory, 40*(3), 333-342.

Mueller, D. (1986). *Measuring Social Attitude: A handbook for research practitioners.* New York, NY: Teacher College Press.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

Parvaiz, A. (2007). School enrolment in J&K. Kashmir Time, 7 July 2007.

Patterson, C. J. (2001). Students' perceptions of classroom climate in Tennessee public high schools. *Dissertation Abstracts International, 61*, 4248-A.

Patton, M. (1987). *How to use qualitative methods in evaluation.* Great Britain: London Sage Publications.

Pillai, N. P. (1969). *An investigation into the Organizational and Administrative Factors which Affect the Achievement of Pupils in Secondary Schools.* In first survey of Research in Education M.B. Buch (Ed.), Manonmaniam Sundaranar University, Baroda.

Planning Commission. (2008). *Eleventh Five Year plan 2007-2012.*Government of India. New Delhi.

Planning Commission. (2011). *Faster, Sustainable and More Inclusive Growth. An Approach to the Twelfth Five Year Plan (2012-17).*Government of India. New Delhi: Indian Offset Press.

Pradhan, N., & Khirwadkar, A. R. (1999). Computer education in secondary schools of baroda city. *Journal of Educational Technology, 2*(2).

Purkey, S., & Smith, M. (1983). Effective schools: A review. *The Elementary School Journal, 83*(4), 427-452.

Rajput, A., Taygi, G ., & Sexena. K. (2012). Emerging issues and challenges in education. *Global & Indian Perspective, Vol. I.* New Delhi: Radha Publication.

Report of the Education Commission. (1964-66). *Education and national development. Ministry of education, Government of India.* New Delhi: First Edition Govt. of India Press.

Roy, A. (2008). *What would independence mean to the people of Kashmir*? The Guardian Newspaper.22 Aug. 2008. Retrieved from http://www.guardian.co.uk/world/2008/aug/22/kashmir.india>.

Schofield, V. (1997). *Kashmir in the Crossfire.* New York: Viva Books Private Limited.

Selwyn, N. (2008). An investigation of differences in undergraduates' academic use of the internet. *University of London, Institute of Education, UK* Copyright © 2008 SAGE Publications (Los Angeles, London, New Delhi and Singapore),*Vol 9*(1), 11–22.

Sheskin, J. D. (2000). *Handbook of parametric and non parametric statistical procedures* (2nd ed.). Chapman & Hall/CRC. Boca Raton London. New York Washington, D.C.

Shrestha, D. A., & Thapa, R. (2007). *The Impact of Armed Conflicts on Women in South Asia.* New Delhi: Manohar Publications.

Sternberg, R. J. (2003). Creative thinking in the classroom. *Scandinavian Journal of Educational Research, 47*(3), 325-338.

Taseer, C. B. (2005). *The Kashmir of Sheikh Abdullah.* New York: Gulshan Books.

Tella, A. (2007). The impact of motivation on student's academic achievement and learning outcomes in mathematics among secondary school students in Nigeria. *Eurasia Journal of Mathematics, Science & Technology Education, 3*(2), 149-156.

The Tribune (2008). "*Dropout rate down in schools - Jammu & Kashmir.*" The Tribune. 26 Feb. 2008. Retrieved from http://www.tribuneindia.com/2008/20080227/j&k.htm#11.

Umme-Kulsum (2002). Teachers attitude, towards computer. *SETRAD, National conference on integration technology into teaching and learning vol.1*, 208-211.

Webester's Student Dictionary. (1996). *The new international Webesters English dictionary of the English language*. International Encyclopedia edition Sidney I. Landua. Trient Press International U.S.

Widmalm, S. (2006). *Kashmir in comparative perspective: Democracy and violent separatism in India.* USA: Oxford [u.a.].

Wiersma, W. (2000). *Research methods in education: An introduction* (7th ed.). Boston: Allyn and Bacon.

Wilson, C. C., & Wlison, E. A. (1969). *Healthful School Environment.* USA: National Association.

Wiseman, S. (1961). *Examinations and English Education.* Manchester: Manchester University Press.

World Bank (2006). *Secondary education in India: Investing in the future.* Human Development Unit, South Asia region, World Bank, draft, April 2006.

World Data on Education. (2011). *Donees mondiales de l' education. Datos Mundiales de Education VIIEd.2010/11.*compiled by UNESCO.IBN/2011/CP/WDE/II UNESCO.IBE http://www.ibe.unesco.org

World Education Report.(UNECSO,1998a). *Teachers and teaching in a changing world* (Summary) [On-Line]. Paris. Retrieved from http://www.unesco.org/education/educprog/wer/wer.htm

Zutshi, U. K. (1986). *Emergence of political awakening in Kashmir.* Manohar: South Asia Books.York: Oxford University Press, USA.

# Appendices

## GENERAL INSTRUCTION

The present endeavor is pertaining to research work and the success of the study will depend upon your honest and frank response. Therefore, it is hoped, you will extend your co-operation whole heartedly in achieving the objective of the study.

**Be sure, your responses will be kept strictly confidential and will be solely used for research purpose only.**

Here is a very important request that please, read questions very carefully and answer them honestly and do not leave any space blank which has been provided for answer.

**Thanks.**

**FARHAT BASHIR**
(Research Scholar)
Department of Education
A.M.U., Aligarh.

# APPENDIX – A

## INFORMATION SCHEDULE FOR SCHOOL

**Kindly answer each statement by giving your response in the space provided.**

1: Name of the school _____

2: Is it Government/Private?_____

3: Is it Co ed. / Boys/ Girl school?_____

4: Is it run by Government /Management/Individual _____

5: Number of students.

a) Boys_____ Girls _____in 9th class. b) Boys _____ Girls _____in 10th class.

b) Boys _____Girls _____in 11th class. b) Boys _____Girls _____in 12th class.

**Instruction**

This information Schedule has 25 items in order to get information regarding the Status of ICT items in the Higher Secondary Schools. Below are the names of some ICT tools with alternative responses, 'Yes' and 'No'. Put a tick mark against response category of each item.

| S.no | ICT ITEMS AVALIABLE IN HIGHER SECONDARY SCHOOLS | RESPONSES | |
|---|---|---|---|
| | | YES | NO |
| 1. | Computer | | |
| 2. | Internet | | |
| 3. | Projector | | |
| 4. | LCD Projector | | |
| 5 | Slide Projector | | |
| 6. | Films available | | |
| 7. | Film Projector | | |
| 8. | Epidiascope | | |
| 9. | Tape-recorder | | |
| 10. | Audio- Cassette | | |
| 11. | Video Cassette | | |
| 12. | On-line teaching/ learning | | |
| 13. | Blackboard | | |
| 14. | Smart-board | | |
| 15. | Whiteboard | | |
| 16. | CD-Player | | |
| 17. | DVD-player | | |
| 18. | CD/DVD | | |
| 19. | Audio-Conference | | |
| 20. | Video-Conference | | |
| 21. | Loud-Speaker | | |
| 22. | T.V. | | |
| 23. | Radio | | |
| 24. | Chart | | |
| 25. | Calculator | | |

## APPENDIX – B

## QUESTIONNAIRE FOR STUDENTS ABOUT USAGE OF ICT

**Kindly answer each statement by giving your response in the space provided below each column.**

| Name of the student | School(Government or Private) | Type of School (Boys /Girls/Co-Edu) |
|---|---|---|
| | | |

### Instruction

**Dear Students**

This questionnaire has 25 items in order to get information regarding the Usage of ICT in the Higher Secondary Schools. Below are given some ICT items along with three alternative responses i.e. (Fully used, Partially used and Not used). You are requested to put a tick mark against response category of each.

| S.no | ITEMS | RESPONSES | | |
|---|---|---|---|---|
| | | FULLY | PARTIALLY | NO |
| 1. | I make use of Computer while learning in school | | | |
| 2. | Internet is utilized during learning in the school | | | |
| 3. | Projector is used while learning in the school | | | |
| 4. | LCD Projector is used in the school while learning | | | |
| 5 | I make use of Slide Projector while learning in the school | | | |
| 6. | The educational Film is used during the process of learning | | | |
| 7. | I use Film Projector for learning in the school | | | |
| 8. | Epidiascope is used in the school | | | |
| 9. | Tape-recorder is used during learning in the school | | | |
| 10. | Audio- Cassette is utilized while learning | | | |
| 11. | Video-Cassette is utilized while learning | | | |
| 12. | On-line learning in the school is used for learning process | | | |
| 13. | The Usage of Blackboard while learning process is | | | |
| 14. | Smart-board is utilized while learning in the school | | | |
| 15. | While learning the Usage of Whiteboard is | | | |
| 16. | CD-Player is used while learning in the school | | | |
| 17. | DVD-player is used while learning in the school | | | |
| 18. | CD/DVD is used by me during learning in the school | | | |
| 19. | Audio-Conference is organized for learning purpose | | | |
| 20. | Video-Conference is organized for learning | | | |
| 21 | Loud-Speaker is used while learning in the school | | | |
| 22. | T.V. is used for learning in the school | | | |
| 23. | I listen educational programmers' on Radio in the school | | | |
| 24. | The Chart is utilized while learning in the school | | | |
| 25. | I make use of Calculator while learning in the school | | | |

## APPENDIX – C

## QUESTIONNAIRE FOR TEACHERS ABOUT USAGE OF ICT

**Kindly answer each statement by giving your response in the space provided below each column.**

| Name of the teacher | School (Government or Private) | Type of School (Boys /Girls/Co-Ed) |
|---|---|---|
| | | |

### Instruction

**Respected Teachers**

This questionnaire has 25 items in order to get information regarding the Usage of ICT in the Higher Secondary Schools. Below are given some ICT items along with three alternative responses i.e. (Fully used, Partially used and Not used). You are requested to put a tick mark against response category of each.

| S.no | ITEMS | RESPONSES | | |
|---|---|---|---|---|
| | | FULLY | PARTIALLY | NO |
| 1. | I make use of Computer while teaching in school | | | |
| 2. | Internet is utilized during teaching in the school | | | |
| 3. | Projector is used while teaching in the school | | | |
| 4. | LCD Projector is used in the school while teaching | | | |
| 5. | I make use of Slide Projector while teaching in the school | | | |
| 6. | The educational Films are used during the process of teaching | | | |
| 7. | I use Film Projector for teaching in the school | | | |
| 8. | Epidiascope is used in the school | | | |
| 9. | Tape-recorder is used during teaching in the school | | | |
| 10. | Audio- Cassette is utilized while teaching | | | |
| 11. | Video-Cassette is utilized while teaching | | | |
| 12. | On-line teaching in the school is used for teaching process | | | |
| 13. | The Usage of Blackboard while teaching process | | | |
| 14. | Smart-board is utilized while teaching in the school | | | |
| 15. | While teaching the Usage of White-board is | | | |
| 16. | CD-Player is used while teaching in the school | | | |
| 17. | DVD-player is used while teaching in the school | | | |
| 18. | CDs/DVDs is used by me during teaching in the school | | | |
| 19. | Audio-Conference is organized for teaching purpose | | | |
| 20. | Video-Conference is organized for teaching | | | |
| 21 | Loud-Speaker is used while teaching in the school | | | |
| 22. | T.V. is used for teaching in the school | | | |
| 23. | I listen educational programmers' on Radio in the school | | | |
| 24 | The Charts are utilized while teaching in the school | | | |
| 25. | I make use of Calculator while teaching in the school | | | |

## APPENDIX - D

| Reliability of Questionnaire for the Students | | | | |
|---|---|---|---|---|
| **Item-Total Statistics** | | | | |
| Name of the items | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
| Computer | 72.8679 | 44.771 | .709 | .718 |
| Internet | 73.1509 | 46.400 | .910 | .724 |
| Projector | 73.2075 | 47.937 | .766 | .733 |
| LCD-Projector | 73.2642 | 50.467 | .000 | .748 |
| Slide-Projector | 73.2642 | 50.467 | .000 | .748 |
| Film | 71.6792 | 47.414 | .410 | .734 |
| Film-Projector | 73.2642 | 50.467 | .000 | .748 |
| Epidiascope | 73.2642 | 50.467 | .000 | .748 |
| Tape-Recorder | 72.1887 | 48.194 | .595 | .735 |
| Audio-Cassette | 72.1887 | 48.194 | .595 | .735 |
| Video-Cassette | 73.1509 | 46.400 | .910 | .724 |
| On-line teaching/learning | 73.2642 | 50.467 | .000 | .748 |
| Blackboard | 71.2642 | 50.467 | .000 | .748 |
| Smart-Boards | 73.2642 | 50.467 | .000 | .748 |
| Whiteboards | 72.1887 | 48.194 | .595 | .735 |
| CD-Player | 73.1509 | 46.400 | .910 | .724 |
| DVD-Player | 73.1509 | 46.400 | .910 | .724 |
| CD/DVD | 73.1509 | 46.400 | .910 | .724 |
| Audio-Conference | 73.2642 | 50.467 | .000 | .748 |
| Video-Conference | 73.2642 | 50.467 | .000 | .748 |
| Loud-Speaker | 72.2642 | 50.467 | .000 | .748 |
| T.V | 73.1509 | 46.400 | .910 | .724 |
| Radio | 73.1509 | 46.400 | .910 | .724 |
| Chart | 71.2642 | 50.467 | .000 | .748 |
| Calculator | 72.1887 | 48.194 | .595 | .735 |

## APPENDIX – E

| Reliability of Questionnaire for the Teachers | | | | |
|---|---|---|---|---|
| **Item-Total Statistics** | | | | |
| Name of the items | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
| Computer | 37.5610 | 19.852 | .554 | .912 |
| Internet | 38.0488 | 19.848 | .894 | .901 |
| Projector | 38.1951 | 21.161 | .742 | .903 |
| LCD-Projector | 38.3415 | 23.730 | .000 | .912 |
| Slide-Projector | 38.3415 | 23.730 | .000 | .912 |
| Film | 36.7561 | 20.889 | .569 | .907 |
| Film-Projector | 38.3415 | 23.730 | .000 | .912 |
| Epidiascope | 38.3415 | 23.730 | .000 | .912 |
| Tape-Recorder | 37.1463 | 21.728 | .492 | .908 |
| Audio-Cassette | 37.1463 | 21.728 | .492 | .908 |
| Video-Cassette | 38.0488 | 19.848 | .894 | .898 |
| On-line teaching/learning | 38.3415 | 23.730 | .000 | .912 |
| Blackboard | 36.3415 | 23.730 | .000 | .912 |
| Smart-boards | 38.3415 | 23.730 | .000 | .912 |
| Whiteboards | 37.1463 | 21.728 | .492 | .908 |
| CD-Player | 38.0488 | 19.848 | .894 | .901 |
| DVD-Player | 38.0488 | 19.848 | .894 | .901 |
| CD-DVD | 38.0488 | 19.848 | .894 | .898 |
| Audio-Conference | 38.3415 | 23.730 | .000 | .912 |
| Video-Conference | 38.3415 | 23.730 | .000 | .912 |
| Loud-Speaker | 37.3415 | 23.730 | .000 | .912 |
| T.V | 38.0488 | 19.848 | .894 | .901 |
| Radio | 38.0488 | 19.848 | .894 | .898 |
| Chart | 36.3415 | 23.730 | .000 | .912 |
| Calculator | 37.1463 | 21.728 | .492 | .908 |

# PUBLICATIONS

## DEVELOPMENT APPROACHES OF INFORMATION & COMMUNCATION TECHNOLOGY IN SCHOOLS

*Farhat Bashir*

Indian Journal for Social Studies and Humanities.(July-Sep 2012)

***ABSTRACT***

*The experience of introducing different ICTs in the classroom and other educational settings all over the world over past several decades is not automatic. The effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology-indeed, but also curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing. ICT help policymakers in developing countries to define a frame work for the appropriate and effective use, of ICTs in their educational system. The paper attempts to deal with the development approaches of ICT in the schools with hierarchy; the emerging approach as a beginning point, and the transforming approach as a goal many perceive as the future of education.*

# ICT: An Innovative Technique in Teacher Training

*Farhat Bashir*

**Emerging Issues and Challenges In Education.(05-May-2012)**

**ABSTRACT**

*Education through ICT (Information and Communication Technology) has become the effective, useful and interesting way of proceeding teaching practice now-a-days. Across the globe, countries have recognized Information and Communication Technology (ICT) as an effective tool in catalyzing the teaching learning process. IT together with Communication Technologies has brought about unprecedented changes in the way people communicate and interact in the society. Our challenging and competitive world demands technology based teaching which is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and modern technologies are demanding teachers to learn how to use these technologies in their teaching. While new technologies augment, the need of innovative teacher training arises. Information and communication technology (ICT) can provide more flexible and effective ways for such professional development for teachers, improve pre- and in-service teacher training, and connect teachers to the global teacher community. The objective of this paper is to study the applications of ICT as an innovative tool in teacher training and its significance to facilitate professional development. The author attempted to show that the exploitation of ICT is not only a matter of new promise but it brings with it new implications and new challenges. In order for innovative teaching to take place, teachers need to be aware of the available resources and how such resources may be useful.*

*KEYWORDS: Information and Communication Technology, Teacher Education.*

# USAGE OF ICT BY FEMALE STUDENTS IN HIGHER SECONDARY SCHOOLS OF DISTRICT ANANTNAG IN(J & K)

***Farhat Bashir***

**Edu Care (A peer Reviewed Journal). (Jan-Dec 2013)**

***ABSTRACT***

*Our world demands the technology enabled schools to provide the knowledge and skills through ICT to the students. ICT can be defined as "anything which allows us to get information, to communicate with each other, or to have an effect on the environment using electronic or digital equipments'. In the present paper an attempt has been made to study the usage of ICT by the females of Higher Secondary Schools of District Anantnag (J&K), India. The study was conducted on 100 female students. The total sample was selected from Higher Secondary Schools by Random sampling technique. The data was analysed with the help of simple percentage. The finding(s) of the study show that the usage of ICT by female students is very low. The paper concludes by considering that the ICT should be gender focused and female students should be encouraged for the suitable usage of ICT in schools.*

*Keywords: ICT; higher Secondary Schools; female students,; gender focused.*

# Usage of ICT by the Students in Higher Secondary Schools of Jammu and Kashmir

**Farhat Bashir, Dr. Mujibul Hassan Siddiqui**
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**IOSR-Journal of Humanities and Social Science. (Online) (Nov-Dec 2012)**

***Abstract :*** *Information and Communication Technology originally is applied to serve as a means of improving efficiency in the educational process. In the present study an attempt was made to check the difference in the usage of ICT between the boy and girl students of Higher Secondary School of Jammu & Kashmir. The sample of the study consisted 100 students (50 boys and 50 girls) selected by random sampling technique from Higher Secondary School of Kashmir. The questionnaire was administered for collecting the data which was constructed by the present investigator .The data was analyzed with the help of percentage and was represented by the graph. The finding of the study shows that the usage of ICT by the students in the Higher Secondary Schools of Jammu and Kashmir is very low. The finding(s) also reveal that the usage of ICT by the boy students is higher as compared to that of girl students.*

***Keywords***: *Higher secondary students, ICT, Usage.*